REPLY TO:
LIMETREE BAY TERMINALS, LLC
1 Estate Hope
Christiansted VI 00820-5652

November 26, 2018

**CERTIFIED MAIL**
**RETURN RECEIPT REQUESTED**

Ms. Suilin Chan, Chief
Air Programs - Permitting Section
U.S. EPA Region 2
290 Broadway
New York, NY 10007-1866

**SUBJECT: Application for Plantwide Applicability Limit (PAL) Permit for Limetree Bay Terminals, LLC and Limetree Bay Refining, LLC, St. Croix, U.S. Virgin Islands**

Dear Ms. Chan,

Attached for your review is the referenced permit application. As provided by the federal Prevention of Significant Deterioration ("PSD") regulation at 40 CFR § 52.21(aa), the Administrator of U.S. EPA is allowed to establish PALs for regulated New Source Review ("NSR") pollutants following receipt of a permit application meeting the minimum requirements at 40 CFR § 52.21(aa)(3). The required information and location of this information within this permit application are as follows:

(i) A list of all emissions units at the stationary source designated as small, significant, or major for each regulated NSR pollutant based on each unit's potential to emit. In addition, the application shall indicate which, if any, applicable requirements, emission limitations, or work practices apply to each unit. This information is provided in the permit application in Sections 2.0 and 3.0, respectively. Supporting information for the unit-by-unit size designations is provided in Appendix B

(ii) Calculations of the baseline actual emissions ("BAE") with supporting documentation. The BAE are to include emissions associated not only with operation of the emissions unit, but also emissions associated with startup, shutdown, and malfunction. This information is provided in the permit application in Section 4.0 and Appendix C.

(iii) The calculation procedures that the owner or operator proposes to use to convert the monitoring system data to monthly emissions and annual emissions based on a 12-month rolling total for each month. This information is provided in Section 6.0.

Should you require further information during your review of this application, please contact Catherine Elizee of my staff at (340) 692-3073.

Sincerely,

Darius Sweet
CEO

Enclosures

cc: Umesh Dholakia (EPA Region 2)w/attachments
Kathlyn P. Worrell-George (DPNR) w/o attachments
Verline Marcellin (DPNR) w/o attachments

# Application for Plantwide Applicability Limitation (“PAL”) Permit

**Prepared for:**

**Limetree Bay Terminals, LLC**
**Limetree Bay Refining, LLC**
**St. Croix, USVI**

**Submitted to:**

**United States Environmental Protection Agency**
**Region 2**
**290 Broadway**
**New York, New York  10007-1866**

**Prepared by:**


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**304-A West Millbrook Road**
**Raleigh, North Carolina 27609**


**November 2018**

## TABLE OF CONTENTS

## List of Tables



## Appendices

# 1.0 INTRODUCTION

On January 4, 2016, Limetree Bay Terminals, LLC ("Limetree Bay Terminals") purchased petroleum refining and terminal assets located in St. Croix, U.S. Virgin Islands ("USVI") from HOVENSA L.L.C. Limetree Bay Terminals has agreements to convey a portion of these assets to Limetree Bay Refining, LLC, an affiliate of Limetree Bay Terminals (collectively, "Limetree Bay Terminals and Refining") . The facility is a major source with respect to the Title V ("Part 70") Operating Permit Program as administered by the USVI Department of Planning and Natural Resources ("DPNR") pursuant to the Virgin Islands Rules & Regulations ("VIR&R"), Title 12 Chapter 09, Section 206-51 et. seq. Plant operations are authorized under Part 70 Air Quality Permit No. STX-TV-003-10, dated July 1, 2010. A timely application for renewal was submitted on December 31, 2014.

The facility is a major stationary source under the Prevention of Significant Deterioration ("PSD") Program as administered by EPA Region II pursuant to 40 CFR 52.21.

With this application, Limetree Bay Terminals and Refining requests that EPA establish plantwide applicability limitations (PALs) and issue a PAL permit to Limetree Bay Terminals and Refining in accordance with 40 CFR 52.21(aa). Pursuant to this request, this permit application contains all information required pursuant to 40 CFR 52.21(aa)(3).

## 1.1 BACKGROUND AND GENERAL DESCRIPTION OF FACILITY

This section provides some historical background related to the construction and operation of the facility and describes the petroleum refinery and terminal processes. To illustrate the location of the plant and its operations, an area map, site plan, and process flow diagrams are included in Appendix A.

### 1.1.1 Plant Location

The Limetree Bay Terminals and Refining facility is located on the south side of the island of St. Croix in the U.S. Virgin Islands. The Universal Transverse Mercator ("UTM") coordinates for the center of the facility property are approximately 314404.64 km East and 1958853.31 km North (Zone 20).

### 1.1.2 Historical Background

The Limetree Bay Terminals and Refining facility ("the source") is a complex, integrated petroleum refinery consisting of refinery process units and various supporting operations including sulfur recovery plants, steam and electric power generation via boilers and gas turbine cogeneration units, wastewater treatment, and a marine terminal. The facility has historically been capable of receiving and processing crude oil from all over the world (over 60 different types of crude oil have been processed). The refinery consists of three separate processing complexes as follows: the Side West Refinery ("West-Side"), constructed in the mid and late 1960s; the East Side Refinery ("East Side"), constructed in the early 1970s; and the Deep Conversion Complex, which includes the Fluid Catalytic Cracking Complex and the Delayed Coker Unit Complex.

In 2010, the refinery's crude oil permitted processing rate was 525,000 barrels per calendar day ("BPCD"), including generally smaller equipment on the West Side and generally larger equipment on the East Side. Some of the refinery process units on the West Side were temporarily idled in early 2011, reducing the refinery's crude charge rate to approximately 350,000 BPCD, and all remaining refinery process units at the facility were temporarily idled in early 2012. Terminal operations, local product distribution, and the emissions units that support those operations have continued to operate.

On January 4, 2016, Limetree Bay Terminals, LLC ("Limetree Bay Terminals") purchased assets from HOVENSA L.L.C. ("HOVENSA"), including the refinery process units and utilities that had been temporarily idled in 2011 and 2012. The asset sale to Limetree Bay Terminals was subject to an agreement between the Government of the Virgin Islands ("GVI") and Limetree Bay Terminals for the operation of the assets acquired by Limetree Bay Terminals ("Operating Agreement"), which was executed by the GVI and Limetree Bay Terminals on December 1, 2015. Under the Operating Agreement, Limetree Bay Terminals is contractually obligated to evaluate the potential for resuming operation of the Refinery during a period ending no later than December 2018. Based on the evaluation, Limetree Bay Terminals plans to resume operation. In support of the resumed operations Limetree Bay Terminals, LLC and Limetree Bay Refining, LLC have entered into two separate Operating Agreements with the GVI. On July 2, 2018, the Governor of the USVI announced that an agreement had been reached with Limetree Bay Terminals, LLC and Limetree Bay Refining, LLC for the restart of the refinery. The two agreements were reviewed and ratified by the Virgin Island Senate on July 25, 2018.

The Operating Agreement with Limetree Bay Refining requires the company to continue to evaluate options for restart of the refinery for a three year period. On November 16, 2018, Limetree Bay Refining announced it had reached a definitive agreement with BP's supply and trading arm relating to supply and product offtake from the restarted refinery. Limetree Bay Refining is continuing to study restart of additional operations.

### 1.1.3 Refinery Process Overview

The refinery operations begin by using atmospheric and vacuum distillation processes to separate the crude oil into various components. Figure A-3 shows the refining processes. Fuel gas produced by the atmospheric and vacuum distillation processes as well as other refinery processes (*i.e.,* desulfurization, cracking, and coking) is routed to one of the facility's fuel gas treatment systems where it is amine treated to remove hydrogen sulfide ("$H_2S$") before it is placed into the mix drum of one of the refinery's clean fuel gas headers. Light end components, naphtha, kerosene, and No. 2 oil produced by the atmospheric and vacuum distillation processes and other refinery processes (*i.e.*, cracking, and coking) are processed at desulfurization units to reduce their sulfur content. As a byproduct of the desulfurization process, $H_2S$ is generated. The $H_2S$ produced by the desulfurizers, as well as any $H_2S$ released when the amine used to treat fuel gas is regenerated, is routed to a sulfur recovery plant ("SRP") where it is converted to elemental sulfur. The SRPs are composed of Claus units followed by tail gas treating units (*i.e.*, Beavon Unit in West Side Refinery and SCOT type tailgas treater in the East Side Refinery). The Beavon Unit exhausts to the atmosphere and has an incinerator that serves as a backup. The SCOT type tail gas treater is followed by a tail gas incinerator (*i.e.*, thermal oxidizer). The recovered sulfur is pelletized for sale.

Desulfurized naphtha is routed to reforming units, which upgrade the naphtha to higher octane gasoline components. Light reformates are sent to the aromatic recovery units which produce sales-grade pure benzene, toluene, and xylenes. Light straight run ("LSR") pentanes from the crude distillation units are isomerized in the Penex process. Heavy atmospheric gas oil from the atmospheric and vacuum distillation units is blended into No. 6 oil. Desulfurized vacuum gas oil is placed into the No. 6 oil pool. The pitch produced by the vacuum distillation process is routed to the delayed coker unit ("Coker").

A state-of-the-art Fluid Catalytic Cracking unit ("FCCU"), which has a permitted charge rate of 165,000 barrels per day was brought on-line in 1993. The FCCU is used to crack heavy gas oil and residual oils in the presence of a catalyst to yield lighter products. The Coker, which was brought on-line in 2002 is used to crack heavy oils to produce gasoline, heating oil, and petroleum coke.

### 1.1.4 Terminal Operations

The facility includes a 45- to 60-foot deep harbor and Marine Terminal that is able to accommodate supertankers. The marine loading facilities consist of 11 deep-water docks for the receipt or shipment of crude oil, refined products, intermediates and petroleum coke. The main crude oil docks can handle vessels with up to a 55-foot draft and 300,000 deadweight tons. The marine terminal also charters and operates a fleet of six tug boats to conduct dock operations. Limetree Bay Terminals is in the process of supplementing the marine terminal's existing marine loading facilities with an offshore single point mooring system ("SPM"), but the project is not complete as of the date of this application. All crude oil and most finished products are transported by means of tanker ships. The facility has 140+ storage tanks and an overall storage capacity of over 30 million barrels of both crude and finished products.

## 1.2 SUMMARY OF PAL REGULATIONS

The federal PAL regulations are contained in 40 CFR 52.21(aa). A PAL is a pollutant-specific, source-wide emission limitation, expressed in tons per year ("TPY"), which provides a voluntary alternative for complying with the PSD permitting program requirements. With a PAL, the owner or operator of a stationary source can make changes to the source without triggering PSD preconstruction permitting requirements as long as emissions do not increase above the limit established by the PAL for a particular pollutant. The pollutants for which PALs are requested are identified in Table 2-1.

### 1.2.1 PAL Permit Application Requirements

The federal PSD regulation at 40 CFR 52.21(aa)(3) requires the owner or operator of a major stationary source requesting a PAL to provide certain information in a PAL permit application. The required information and location of this information within this permit application are as follows:

1. A list of all emissions units at the stationary source designated as small, significant, or major for each regulated NSR pollutant based on their potential to emit. In addition, the owner or operator of the stationary source shall indicate which, if any, Federal or State applicable requirements, emission limitations, or work practices apply to each unit. This information is provided in Sections 2.0 and 3.0, respectively.
2. Calculations of the baseline actual emissions ("BAE") with supporting documentation. The BAE are to include emissions associated not only with operation of the emissions unit, but also emissions associated with startup, shutdown, and malfunction. This information is provided in Section 4.0 and Appendix B.
3. The calculation procedures that the major stationary source owner or operator proposes to use to convert the monitoring system data to monthly emissions and annual emissions based on a 12-month rolling total for each month as required by 40 CFR 52.21(aa)(13)(i). This information is provided in Section 6.0.

The federal PSD regulation at 40 CFR 52.21(aa)(6) prescribes the procedure for calculating the PAL level. As discussed in more detail in Section 6.0, this procedure has been used by Limetree Bay Terminals and Refining to calculate the PAL levels proposed by this application. At 40 CFR 52.21(aa)(6) it states the following:

(i) *Except as provided in paragraph (aa)(6)(ii) and (iii) of this section, the plan*[1] *shall provide that the actuals PAL level for a major stationary source or a GHG-only source shall be established as the sum of the baseline actual emissions (as defined in paragraph (b)(48) of this section or, for GHGs, paragraph (aa)(2)(xiii) of this section) of the PAL pollutant for each emissions unit at the source; plus an amount equal to the applicable significant level for the PAL pollutant under paragraph (b)(23) of this section or under the Act, whichever is lower. When establishing the actuals PAL level, for a PAL pollutant, only one consecutive 24-month period must be used to determine the baseline actual emissions for all existing emissions units. However, a different consecutive 24-month period may be used for each different PAL pollutant. Emissions associated with units that were permanently shut down after this 24-month period must be subtracted from the PAL level. The reviewing authority shall specify a reduced PAL level(s) (in tons/yr) in the PAL permit to become effective on the future compliance date(s) of any applicable Federal or State regulatory requirement(s) that the reviewing authority is aware of prior to issuance of the PAL permit. For instance, if the source owner or operator will be required to reduce emissions from industrial boilers in half from baseline emissions of 60 ppm* $NO_X$ *to a new rule limit of 30 ppm, then the permit shall contain a future effective PAL level that is equal to the current PAL level reduced by half of the original baseline emissions of such unit(s).*

(ii) *For newly constructed units (which do not include modifications to existing units) on which actual construction began after the 24-month period, in lieu of adding the baseline actual emissions as specified in paragraph (aa)(6)(i) of this section, the emissions must be added to the PAL level in an amount equal to the potential to emit of the units.*

### 1.2.2 General Conditions

The requirements at 40 CFR 52.21(aa)(4), (5), and (7) establish general requirements that must be met to establish a PAL and issue a PAL permit. These requirements are summarized below:

(i) The PAL permit application shall be processed using a procedure that is consistent with 40 CFR 51.160 and 51.161.

(ii) This includes the requirement that EPA provide the public with notice of the proposed approval of a PAL permit and at least a 30-day period for public comment. The agency must address all material comments before taking final action on the permit application.

(iii) Each PAL shall regulate emissions of only one pollutant.[2]

(iv) Each PAL shall have a PAL effective period of ten (10) years.

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[1] The provisions of 40 CFR 52.21 are incorporated by reference into the Virgin Islands State Implementation Plan at 40 CFR §52.2779.

[2] A PAL permit may regulate multiple pollutants.

(v) The PAL shall impose an annual emissions limitation that is expressed in tons per year, that is enforceable as a practical matter, and that is applicable to the entire major stationary source.

(vi) The PAL shall include fugitive emissions, to the extent quantifiable, from all emissions units that emit or have the potential to emit the PAL pollutant at the major stationary source.

(vii) For each month during the first eleven (11) months from the PAL effective date, the major stationary source owner or operator shall show that the sum of the preceding monthly emissions from the PAL effective date for each emissions unit under the PAL is less than the PAL.

(viii) For each month during the PAL effective period after the first twelve (12) months of establishing a PAL, the major stationary source owner or operator shall show that the sum of the monthly emissions from each emissions unit under the PAL for the previous twelve (12) consecutive months is less than the PAL.

(ix) The owner or operator shall comply with the monitoring, recordkeeping, and reporting and notification requirements at 40 CFR 52.21(aa)(12) - (14) for each emissions unit under the PAL through the PAL effective period.

(x) The PAL permit shall contain all the requirements of 40 CFR 52.21(aa)(7). In addition to specifying the PAL pollutant and the applicable emission limitation in tons per year, the permit shall include the following:

a. The PAL permit effective date and expiration date of the PAL;
b. Specification that if a major stationary source owner or operator applies to renew a PAL before the end of the PAL effective period, the PAL shall not expire at the end of effective period, but shall remain in effect until the agency issues a revised PAL permit;
c. Requirement that emissions calculations for compliance purposes include emissions from start-ups, shutdowns, and malfunctions;
d. Requirement that once the PAL expires, the major stationary source is subject to the requirements at 40 CFR 52.21(aa)(9);
e. The calculation procedures the major stationary source shall use to convert the monitoring system data to monthly emissions and annual emissions based on a 12-month rolling total as required by 40 CFR 52.21(aa)(13)(i); and
f. Monitoring, recordkeeping, and reporting requirements under 40 CFR 52.21(aa)(12), (13), and (14).

### 1.2.3 PSD Applicability and Definition of "Major Modification"

Establishment of a PAL changes the applicability criteria and requirements of the PSD program in 40 CFR 52.21. Specifically:

(i) Pursuant to the definition of "major modification" at 40 CFR 52.21(b)(2)(iv), the conventional definition of the term "major modification" and the usual process for determining whether a project is a major modification do not apply with respect to the pollutants for which PALs are established.

(ii) Pursuant to 40 CFR 52.21(r)(6), during the PAL effective period, the monitoring, recordkeeping, and reporting requirements applicable under the so-called actual-to-projected-actual applicability test do not apply with respect to the pollutants for which PALs are established.

Instead, during the PAL effective period, the definition of "PAL major modification" at 40 CFR 52.21(aa)(2)(viii) applies with respect to the pollutants for which PALs are established, and PSD review is required with respect to such pollutants only as provided at 40 CFR 52.21(aa)(11).

## 1.3 APPLICATION ORGANIZATION

The remaining sections of this permit application are organized as follows:

<u>Section 2: PAL Emissions Units</u> – This section provides a list of all emissions units at the Limetree Bay Terminals and Refining facility that emit any of the pollutants for which Limetree Bay Terminals and Refining is requesting that EPA establish a PAL, including each emissions unit's designation as a small, significant, or major emissions unit.

<u>Section 3: Applicable Requirements, Emission Limitations, and Work Practices</u> – For each emissions unit identified in Section 2, this section lists all federal or territorial applicable requirements that restrict actual emissions from that unit, including emission limitations and work practice requirements.

<u>Section 4: Calculation of Baseline Actual Emissions</u> – For each emissions unit identified in Section 2, this section presents calculations of BAE for each pollutant for which Limetree Bay Terminals and Refining is requesting that EPA establish a PAL.

<u>Section 5: Proposed PAL</u> – This section proposes the PAL values for the proposed PAL pollutants that should be included in the PAL permit.

<u>Section 6: Proposed PAL Monitoring, Calculation Procedures, and Recordkeeping</u> – This section describes the calculation procedures which Limetree Bay Terminals and Refining propose to use to convert the monitoring system data to monthly emissions and annual emissions, based on a 12-month rolling total for each month, to demonstrate compliance with the requested PALs.

## 2.0 IDENTIFICATION OF PAL EMISSIONS UNITS

In accordance with 40 CFR 52.21(aa)(3), Table 2-2 presents a listing of all emissions units located at Limetree Bay Terminals and Refining that emit or have the potential to emit any of the pollutants for which this application is requesting that EPA establish a PAL. Emissions units which existed during the selected baseline period for a particular pollutant but which have been permanently shut down are listed and are identified as shut down. All emissions units listed in Table 2-2 and not specifically designated as "permanently shut down" are existing emissions units, which have not been permanently shut down. In addition, for each emissions unit (other than permanently shut down emissions units) and for each proposed PAL pollutant, the table also denotes the unit's designation as a small emissions unit, a significant emissions unit, or a major emissions unit.[3] The meaning of these terms is as follows:

> **Small Emissions Unit:** Pursuant to 40 CFR 52.21(aa)(2)(iii), a small emissions unit is one that has the potential to emit the pollutant in an amount less than the significant level for that PAL pollutant.
>
> **Significant Emissions Unit:** Pursuant to 40 CFR 52.21(aa)(2)(xi), a significant emissions unit is one that has the potential to emit a PAL pollutant in an amount that is equal to or greater than the significant level for that pollutant, but less than the amount that would qualify the unit as a major emissions unit.
>
> **Major Emissions Unit:** Pursuant to 40 CFR 52.21(aa)(2)(iv), a major emissions unit is one that has the potential to emit 100 TPY or more of the pollutant, unless a lower threshold applies pursuant to part D of the federal Clean Air Act. Pursuant to 40 CFR § 81.356, St. Croix is designated attainment or unclassifiable for all criteria pollutants, so no lower thresholds apply.

For each of the pollutants for which Limetree Bay Terminals and Refining is requesting that EPA establish a PAL, the significant level is established per 40 CFR 52.21(b)(23)(i). These levels, which are used to distinguish between small and significant emissions units, are presented in Table 2-1.[4]

In accordance with 40 CFR 52.21(aa)(3)(i), Table 2-2 lists all emissions units at this source designated as small, significant, or major for each pollutant for which a PAL is requested.

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[3] The potential to emit for each emissions unit pollutant combination are provided in Appendix B.
[4] Because the significant level for CO is 100 TPY, there are only two classifications, small and major.

**Table 2-1. Listing of the Applicable Significant Levels**

| Regulated NSR Pollutant | Significant Level (TPY) |
|---|---|
| Sulfur Dioxide (“$SO_2$”) | 40 |
| Oxides of Nitrogen (“$NO_X$”) | 40 |
| Volatile Organic Compounds (“VOC”) | 40 |
| Carbon Monoxide (“CO”) | 100 |
| Particulate Matter (“PM”) | 25 |
| PM with an aerodynamic diameter less than or equal to a nominal 10 micrometers (“$PM_{10}$”) | 15 |
| PM with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers (“$PM_{2.5}$”) | 10 |
| Sulfuric Acid Mist (“$H_2SO_4$”) | 7 |

## Table 2-2  Listing of PAL Emissions Units and PTE Designation

| Process Unit | Source Identification (ID) | Unit Description | Emissions Unit Designation [1] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | $SO_2$ | $NO_X$ | CO | PM | $PM_{10}$ | $PM_{2.5}$ | VOC |
| #2 DU | #2 DU Process Unit | Process Fugitives | - | - | - | - | - | - | Small |
| #2 DU Fractionator | H-101 | Heater | Major | Major | Small | Small | Small | Sig. | Small |
| #2 DU Fractionator | H-104 | Heater | Major | Major | Small | Small | Small | Small | Small |
| #2 CDU | #2 CDU Process Unit | Process Fugitives | - | - | - | - | - | - | Small |
| #2 CDU | H-401A | Charge Heater | Major | Major | Small | Small | Sig. | Sig. | Small |
| #2 CDU | H-401B | Charge Heater | Major | Major | Small | Small | Sig. | Sig. | Small |
| #2 CDU | H-401C | Charge Heater | Major | Major | Small | Small | Sig. | Sig. | Small |
| #3 CDU/1 VAC | #3 CDU & 1 VAC Process Unit | Process Fugitives | - | - | - | - | - | - | Small |
| #3 CDU | H-1401A | Charge Heater | Permanently shut down emissions unit [2] | | | | | | |
| #1 VAC | H-1401B | Charge Heater | Permanently shut down emissions unit [2] | | | | | | |
| #3 DD | #3 DD | Process Fugitives | - | - | - | - | - | - | Small |
| #3 DD | H-1500 | Reactor Charge Heater | Permanently shut down emissions unit [2] | | | | | | |
| #3 DD | H-1501 | Fractionator Reboiler Heater | Permanently shut down emissions unit [2] | | | | | | |
| #3 DD | C-1500A | Reciprocating Gas Compressor | Small | Sig. | Small | Small | Small | Small | Small |
| #3 DD | C-1500B | Reciprocating Gas Compressor | Small | Sig. | Small | Small | Small | Small | Small |
| #3 DD | C-1500C | Reciprocating Gas Compressor | Small | Sig. | Small | Small | Small | Small | Small |
| Penex | Penex Process Unit | Process Fugitives | - | - | - | - | - | - | Small |
| Penex | H-200 | Charge Heater | Small | Small | Small | Small | Small | Small | Small |
| Penex | H-201 | Fired Reboiler Heater | Small | Small | Small | Small | Small | Small | Small |
| Penex | H-202 | Hot Oil Heater | Small | Major | Small | Small | Small | Small | Small |
| Penex | C-200A | Reciprocating Gas Compressor | Small | Small | Major | Small | Small | Small | Small |

| Process Unit | Source Identification (ID) | Unit Description | Emissions Unit Designation [1] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | $SO_2$ | $NO_X$ | CO | PM | $PM_{10}$ | $PM_{2.5}$ | VOC |
| Penex | C-200B | Reciprocating Gas Compressor | Small | Small | Major | Small | Small | Small | Small |
| Penex | C-200C | Reciprocating Gas Compressor | Small | Small | Major | Small | Small | Small | Small |
| #3 Amine | Unit No. 0920 | Process Fugitives | - | - | - | - | - | - | Small |
| Utility Fractionation | Utility Fractionation Process Unit | Process Fugitives | - | - | - | - | - | - | Small |
| Utility Fractionation | H-160 | Charge Heater | Small | Major | Small | Small | Small | Small | Small |
| #2 Platformer | #2 Platformer Process Unit | Process Fugitives | - | - | - | - | - | - | Small |
| #2 Platformer | H-600 | Unifining Charge Heater | Permanently shut down emissions unit [2] | | | | | | |
| #2 Platformer | H-601 | Stripper Reboiler Heater | Small | Small | Small | Small | Small | Small | Small |
| #2 Platformer | H-602 | Platforming Charge Heater | Permanently shut down emissions unit [2] | | | | | | |
| #2 Platformer | H-603 | Platforming No. 1 Interheater | Permanently shut down emissions unit [2] | | | | | | |
| #2 Platformer | H-604 | Platforming No. 2 Interheater | Small | Small | Small | Small | Small | Small | Small |
| #2 Platformer | H-605 | Platforming No. 3 Interheater | Small | Small | Small | Small | Small | Small | Small |
| #2 Platformer | H-606 | Depentanizer Reboiler Heater | Permanently shut down emissions unit [2] | | | | | | |
| #2 DU | #2 DU Process Unit | Process Fugitives | - | - | - | - | - | - | Small |
| #2 DU | H-800A | Reactor Charge Heater | Small | Small | Small | Small | Small | Small | Small |
| #2 DU | H-800B | Reactor Charge Heater | Small | Small | Small | Small | Small | Small | Small |
| #2 DU | H-801 | Stripper Heater | Small | Major | Small | Small | Small | Small | Small |
| #2 VAC | #2 VAC Process Unit | Process Fugitives | - | - | - | - | - | - | Small |
| #2 VAC | H-2101 | Charge Heater | Permanently shut down emissions unit [2] | | | | | | |
| #2 VAC | H-2102 | Charge Heater | Permanently shut down emissions unit [2] | | | | | | |
| #2 VIS | #2 VIS Process Unit | Process Fugitives | - | - | - | - | - | - | Small |

| Process Unit | Source Identification (ID) | Unit Description | Emissions Unit Designation [1] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | $SO_2$ | $NO_X$ | CO | PM | $PM_{10}$ | $PM_{2.5}$ | VOC |
| #2 VIS | H-2185 | Visbreaking Heater | Permanently shut down emissions unit [2] | | | | | | |
| #4 DD | #4 DD Process Unit | Process Fugitives | - | - | - | - | - | - | Small |
| #4 DD | H-2201A | Reactor Charge Heater | Small | Small | Small | Small | Small | Small | Small |
| #4 DD | H-2201B | Reactor Charge Heater | Small | Small | Small | Small | Small | Small | Small |
| #4 DD | H-2202 | Stripper Reboiler Heater | Small | Major | Small | Small | Small | Small | Small |
| #5 DD | #5 DD Process Unit | Process Fugitives | - | - | - | - | - | - | Small |
| #5 DD | H-2400 | Charge Heater | Small | Small | Small | Small | Small | Small | Small |
| #5 DD | H-2401 | Reboiler Heater | Permanently shut down emissions unit [1] | | | | | | |
| #5 DD | C-2400A | Reciprocating Gas Compressor | Small | Small | Small | Small | Small | Small | Small |
| #5 DD | C-2400B | Reciprocating Gas Compressor | Small | Small | Small | Small | Small | Small | Small |
| Naphtha Fractionation | Naphtha Frac. Process Unit | Process Fugitives | - | - | - | - | - | - | Small |
| Naphtha Fractionation | H-2501 | Reboiler Heater | Small | Major | Small | Small | Small | Small | Small |
| #2 Platformer | #2 Plat Vent | Plat No. 2 Catalyst Regen Vent | Small | - | Small | - | - | - | Small |
| #2 Sulfolane | #2 Sulfolane Process Unit | Process Fugitives | - | - | - | - | - | - | Small |
| #2 Sulfolane | H-4502 | Benzene Column Reboiler Heater | Small | Major | Small | Small | Small | Small | Small |
| #2 Sulfolane | H-4503 | Toluene Column Reboiler Heater | Small | Major | Small | Small | Small | Small | Small |
| #2 Sulfolane | H-4504 | Xylene Column Reboiler Heater | Small | Major | Small | Small | Small | Small | Small |
| #2 Sulfolane | H-4505 | Raffinate Splitter Reboiler Heater | Small | Major | Small | Small | Small | Small | Small |
| #5 CDU | #5 CDU Process Unit | Process Fugitives | - | - | - | - | - | - | Sig. |
| #5 CDU | H-3101A | Crude Charge Heater | Major | Major | Major | Sig. | Sig. | Sig. | Small |
| #5 CDU | H-3101B | Crude Charge Heater | Major | Major | Major | Sig. | Sig. | Sig. | Small |
| #6 CDU | #6 CDU Process Unit | Process Fugitives | - | - | - | - | - | - | Sig. |

| Process Unit | Source Identification (ID) | Unit Description | Emissions Unit Designation [1] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | $SO_2$ | $NO_X$ | CO | PM | $PM_{10}$ | $PM_{2.5}$ | VOC |
| #6 CDU | H-4101A | Crude Charge Heater | Major | Major | Major | Sig. | Sig. | Sig. | Small |
| #6 CDU | H-4101B | Crude Charge Heater | Major | Major | Major | Sig. | Sig. | Sig. | Small |
| Disulfide | Disulfide Process Unit | Process Fugitives | - | - | - | - | - | - | Small |
| #3 Platformer | #3 Platformer Process Unit | Process Fugitives | - | - | - | - | - | - | Small |
| #3 Platformer | H-4401 | Charge Heater | Small | Major | Small | Small | Small | Small | Small |
| #3 Platformer | H-4402 | Fired Reboiler Heater | Small | Major | Small | Small | Small | Small | Small |
| #3 Platformer | H-4451 | Charge Heater | Small | Major | Major | Small | Small | Sig. | Small |
| #3 Platformer | H-4452 | Intermediate Heater | Small | Major | Small | Small | Small | Small | Small |
| #3 Platformer | H-4453 | Intermediate Heater | Small | Major | Small | Small | Small | Small | Small |
| #3 Platformer | H-4454 | Intermediate Heater | Small | Small | Small | Small | Small | Small | Small |
| #3 Platformer | H-4455 | Fired Reboiler Heater | Small | Major | Small | Small | Small | Small | Small |
| #3 VAC | #3 VAC Process Unit | Process Fugitives | - | - | - | - | - | - | Small |
| #3 VAC | H-4201 | Prestripper Heater | Major | Major | Small | Sig. | Sig. | Sig. | Small |
| #3 VAC | H-4202 | Vacuum Heater | Major | Major | Small | Sig. | Sig. | Sig. | Small |
| #4 Platformer | #4 Platformer Process Unit | Process Fugitives | - | - | - | - | - | - | Small |
| #4 Platformer | H-5401 | Charge Heater | Small | Major | Small | Small | Small | Small | Small |
| #4 Platformer | H-5402 | Fired Reboiler Heater | Small | Major | Small | Small | Small | Small | Small |
| #4 Platformer | H-5451 | Charge Heater | Small | Major | Major | Small | Small | Sig. | Small |
| #4 Platformer | H-5452 | Intermediate Heater | Small | Major | Small | Small | Small | Small | Small |
| #4 Platformer | H-5453 | Intermediate Heater | Small | Major | Small | Small | Small | Small | Small |
| #4 Platformer | H-5454 | Intermediate Heater | Small | Small | Small | Small | Small | Small | Small |
| #4 Platformer | H-5455 | Fired Reboiler Heater | Small | Major | Small | Small | Small | Small | Small |
| #6 DD | #6 DD Process Unit | Process Fugitives | - | - | - | - | - | - | Small |
| #6 DD | H-4601A | Reactor Charge Heater | Small | Small | Small | Small | Small | Small | Small |

| Process Unit | Source Identification (ID) | Unit Description | Emissions Unit Designation [1] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | $SO_2$ | $NO_X$ | CO | PM | $PM_{10}$ | $PM_{2.5}$ | VOC |
| #6 DD | H-4601B | Reactor Charge Heater | Small | Small | Small | Small | Small | Small | Small |
| #6 DD | H-4602 | Stripper Reboiler Heater | Small | Major | Small | Small | Small | Small | Small |
| #6 DD | C-4601A | Reciprocating Gas Compressor | Small | Major | Small | Small | Small | Small | Small |
| #6 DD | C-4601B | Reciprocating Gas Compressor | Small | Major | Small | Small | Small | Small | Small |
| #6 DD | C-4601C | Reciprocating Gas Compressor | Small | Major | Small | Small | Small | Small | Small |
| #7 DD | #7 DD Process Unit | Process Fugitives | - | - | - | - | - | - | Small |
| #7 DD | H-4301A | Reactor Charge Heater | Small | Small | Small | Small | Small | Small | Small |
| #7 DD | H-4301B | Reactor Charge Heater | Small | Small | Small | Small | Small | Small | Small |
| #7 DD | H-4302 | Stripper Reboiler Heater | Small | Major | Small | Small | Small | Small | Small |
| #9 DD | #9 DD Process Unit | Process Fugitives | - | - | - | - | - | - | Small |
| #9 DD | H-5301A | Reactor Charge Heater | Small | Small | Small | Small | Small | Small | Small |
| #9 DD | H-5301B | Reactor Charge Heater | Small | Small | Small | Small | Small | Small | Small |
| #9 DD | H-5302 | Stripper Reboiler Heater | Small | Major | Small | Small | Small | Small | Small |
| LSG Unit | LSG Unit Process Unit | Process Fugitives | - | - | - | - | - | - | Small |
| LSG Unit | H-4901 | Charge Heater | Small | Small | Small | Small | Small | Small | Small |
| Hydrogen Plant | | Hydrogen Plant Heater | Unit was never constructed | | | | | | |
| #3 Platformer | #3 Plat Vent | Plat No. 3 Catalyst Regen Vent | Small | - | Small | - | - | - | Small |
| #4 Platformer | #4 Plat Vent | Plat No. 4 Catalyst Regen Vent | Small | - | Small | - | - | - | Small |
| Alkylation Unit and Acid Plant | Unit No. 7200 | Process Fugitives | - | - | - | - | - | - | Small |
| Dimersol Unit | Unit No. 7300 | Process Fugitives | - | - | - | - | - | - | Small |
| FCC and Gas Concentration | FCCU Process Unit and Unit No. 7100 | Process Fugitives | - | - | - | - | - | - | Sig. |
| FCCU | FCCU stack STK-7051 | Fluid Catalytic Cracking | Major | Major | Major | Major | Major | Major | Sig. |

| Process Unit | Source Identification (ID) | Unit Description | Emissions Unit Designation [1] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | $SO_2$ | $NO_X$ | CO | PM | $PM_{10}$ | $PM_{2.5}$ | VOC |
| Deiso-Hexanizer | Deiso-Hexanizer Process Unit | Process Fugitives | - | - | - | - | - | - | Small |
| #3, 4, 5 Amine and T-931 | #3, 4, 5 Amine Process Unit | Process Fugitives | - | - | - | - | - | - | Small |
| #6 & 7 Amine and SHU | Unit No. 7450 and Unit No. 7600 | Process Fugitives | - | - | - | - | - | - | Small |
| Merox Unit | Unit No. 7500 | Process Fugitives | - | - | - | - | - | - | Small |
| 1&2 GRU/$H_2$ CON | 1&2 GRU/$H_2$ CON | Process Fugitives | - | - | - | - | - | - | Small |
| 1&2 LPG Treater | 1&2 LPG Treater | Process Fugitives | - | - | - | - | - | - | Small |
| 3 LPG Fractionator | 3 LPG Fractionator | Process Fugitives | - | - | - | - | - | - | Small |
| Light Ends Treater | Light Ends Treater | Process Fugitives | - | - | - | - | - | - | Small |
| MTBE | MTBE | Process Fugitives | - | - | - | - | - | - | Small |
| TAME | TAME | Process Fugitives | - | - | - | - | - | - | Small |
| Selective Hydro | Selective Hydro | Process Fugitives | - | - | - | - | - | - | Small |
| 1 Beavon / 1&2 SRU | 1 Beavon / 1&2 SRU | Process Fugitives | - | - | - | - | - | - | Small |
| 2 Beavon / 3&4 SRU | 2 Beavon / 3&4 SRU | Process Fugitives | - | - | - | - | - | - | Small |
| SRU | SRU | Process Fugitives | - | - | - | - | - | - | - [4] |
| 3 SWS | 3 SWS | Process Fugitives | - | - | - | - | - | - | - [4] |
| 4 SWS | 4 SWS | Process Fugitives | - | - | - | - | - | - | - [4] |
| 5 SWS | 5 SWS | Process Fugitives | - | - | - | - | - | - | - [4] |
| 6 SWS | 6 SWS | Process Fugitives | - | - | - | - | - | - | Small |
| East Fuel Gas System | East Fuel Gas System | Process Fugitives | - | - | - | - | - | - | Small |
| West Fuel Gas System | West Fuel Gas System | Process Fugitives | - | - | - | - | - | - | Small |
| Terminal | Terminal (Offsites/ Rundowns/xfers) | Process Fugitives | - | - | - | - | - | - | Major |
| Sulfuric Acid Plant | STK-7801 (H-7801, H-7802, & R-7801) | Heater Stack (Process Air Heater, Converter Heater & Startup Heater) | Small | Small | Small | Small | Small | Small | Small |

| Process Unit | Source Identification (ID) | Unit Description | Emissions Unit Designation [1] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | $SO_2$ | $NO_X$ | CO | PM | $PM_{10}$ | $PM_{2.5}$ | VOC |
| Sulfuric Acid Plant | STK-7802 | Process Stack | Major | Sig. | - | - | - | - | - |
| West Sulfur Recovery | Unit Nos. 1030 & 1040, H-1061, T-1061, H-1032, H-1042 & Beavon CT #1 | West Sulfur Recovery Plant | Major | Small | Major | Major | Small | Small | Small |
| East Sulfur Recovery | Unit Nos. 4740 & 4750, H-4761, T-4761, H-4745 & Beavon CT #2 | East Sulfur Recovery Plant | Major | Small | Major | Major | Small | Small | Sig. |
| West Refinery Process Drains | Oily Water Collection System | Process Drain Fugitives | - | - | - | - | - | - | Small |
| East Refinery Process Drains | Oily Water Collection System | Process Drain Fugitives | - | - | - | - | - | - | Small |
| FCC Complex / Delayed Coker Unit | Oily Water Collection System | Process Drain Fugitives | - | - | - | - | - | - | Small |
| Terminal | Oily Water Collection System | Process Drain Fugitives | - | - | - | - | - | - | Small |
| Advanced Wastewater Treatment Plant (AWWTP) | #1 API (Unit No. 1660) | Oil/Water Separator | - | - | - | - | - | - | Major |
| | #1 WEMCO | Induced Air Floatation Unit | | | | | | | |
| | #1 Lagoon[3] | Aerated Lagoon | | | | | | | |
| | #2 API (Unit No. 1661) | Oil/Water Separator | | | | | | | |
| | #2 WEMCO | Induced air floatation unit | | | | | | | |
| | #2 Lagoon[3] | Aerated lagoon | | | | | | | |
| | West Benzene Stripper (STK-3510) | Air Stripper | | | | | | | |
| | #3 API (Unit No. 1662) | Oil/Water Separator | | | | | | | |
| | #3 WEMCO | Induced air floatation unit | | | | | | | |
| | #3 Lagoon[3] | Aerated lagoon | | | | | | | |
| | East Benzene Stripper (STK-3530) | Air Stripper | | | | | | | |
| | Advanced Wastewater Treatment | Advanced Wastewater Treatment Plant | | | | | | | |

| Process Unit | Source Identification (ID) | Unit Description | Emissions Unit Designation [1] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | $SO_2$ | $NO_X$ | CO | PM | $PM_{10}$ | $PM_{2.5}$ | VOC |
| West Sulfur Storage Area | Materials Handling | Materials Handling | - | - | - | Small | Small | Small | - |
| East Sulfur Storage Area | Materials Handling | Materials Handling | - | - | - | Small | Small | Small | - |
| Sulfur Storage, Handling & Shipping | Materials Handling | Materials Handling | - | - | - | Small | Small | Small | - |
| Catalyst Handling | Materials Handling | Materials Handling | - | - | - | Small | Small | Small | - |
| Road Dust | Road Dust | Road Dust | - | - | - | Small | Small | Small | - |
| Painting | Painting | Painting | - | - | - | - | - | - | Small |
| Firefighter Training | Firefighter Training | Firefighter Training | - | Small | Small | Small | Small | Small | Small |
| West-side Refinery Flare System | #2 Flare (H-1105) | H-1105 - Gas burner | Major | Major | Major | Small | Sig. | Sig. | Major |
| | #3 Flare (H-1104) | H-1104 – Gas burner | | | | | | | |
| East-side Refinery Flare System | #5 Flare (H-3351) | H-3351 - Gas burner | Major | Major | Major | Sig. | Major | Major | Major |
| | #6 Flare (H-3352) | H-3352 - Gas burner | | | | | | | |
| | #7 Flare (H-3301) | N-3301 - Gas burner | | | | | | | |
| FCC/Coker Refinery Flare System | FCC Flare (L.P. Flare - STK 7941) | Gas burner, steam assisted | Major | Major | Major | Small | Sig. | Sig. | Major |
| | Ground Flare (H.P. Flare - STK 7942) | Gas burner | | | | | | | |
| Tank 7921 Flare System | LPG Flare (STK 7921) | Gas burner, steam assisted | Major | Small | Major | Small | Small | Small | Major |
| Delayed Coker Unit | Delayed Coker Unit Process Unit | Process Fugitives | - | - | - | - | - | - | Sig. |
| Delayed Coker Unit | H-8501A | Coker process heater 1 | Small | Sig. | Small | Small | Small | Small | Small |
| Delayed Coker Unit | H-8501B | Coker process heater 2 | Small | Sig. | Small | Small | Small | Small | Small |
| Delayed Coker Unit | TK-8501 (Hot pitch tank) | Fixed roof storage tank (pitch) | - | - | - | - | - | - | Sig. |
| Coker Complex | Coke handling, storage, & loading system | Transportation and breaking of solid coke between drums and dock | - | - | - | Small | Small | Small | - |

| Process Unit | Source Identification (ID) | Unit Description | Emissions Unit Designation [1] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | $SO_2$ | $NO_X$ | CO | PM | $PM_{10}$ | $PM_{2.5}$ | VOC |
| Coker Complex | Tank TK-8511 and Residuals Recycling System | Tank TK-8511 and recycling system | - | - | - | - | - | - | Small |
| Coker Complex | Delayed Coker Steam Vent | Delayed Coker Steam Vent | Small | - | Small | Small | Small | Sig. | Sig. |
| Utilities (Powerhouse and Boilers) | Utilities (Powerhouse and Boilers) | Process Fugitives | - | - | - | - | - | - | Small |
| Utility II | #1 Boiler (B-1151) | Boiler; Produces Steam | Permanently shut down emissions unit [2] | | | | | | |
| Utility II | #3 Boiler (B-1153) | Boiler; Produces Steam | Permanently shut down emissions unit [2] | | | | | | |
| Utility II | #4 Boiler (B-1154) | Boiler; Produces Steam | Permanently shut down emissions unit [2] | | | | | | |
| Utility II | #5 Boiler (B-1155) | Boiler; Produces Steam | Major | Major | Major | Sig. | Sig. | Sig. | Small |
| Utility III | #6 Boiler (B-3301) | Boiler; Produces Steam | Major | Major | Small | Sig. | Sig. | Sig. | Small |
| Utility III | #7 Boiler (B-3302) | Boiler; Produces Steam | Major | Major | Small | Sig. | Sig. | Sig. | Small |
| Utility III | #8 Boiler (B-3303) | Boiler; Produces Steam | Major | Major | Major | Sig. | Sig. | Sig. | Small |
| Utility III | #9 Boiler (B-3304) | Boiler; Produces Steam | Major | Major | Major | Sig. | Sig. | Sig. | Small |
| Utility III | #10 Boiler (B-3701) | Boiler; Produces Steam | Small | Sig. | Small | Small | Small | Small | Small |
| Powerhouse 1 | GT No. 1 (G-1101E) | Turbine; Produces Electricity | Permanently shut down emissions unit [2] | | | | | | |
| Powerhouse 1 | GT No. 2 (G-1101F) | Turbine; Produces Electricity | Permanently shut down emissions unit [2] | | | | | | |
| Powerhouse 1 | GT No. 3 (G-1101G) | Turbine; Produces Electricity | Permanently shut down emissions unit [2] | | | | | | |
| Powerhouse 2 | GT No. 4 (G-3404) | Turbine; Produces Electricity | Major | Major | Major | Small | Small | Sig. | Small |
| Powerhouse 2 | GT No. 5 (G-3405) | Turbine; Produces Electricity | Major | Major | Major | Small | Small | Sig. | Small |
| Powerhouse 2 | GT No. 6 (G-3406) | Turbine; Produces Electricity | Permanently shut down emissions unit [2] | | | | | | |
| Powerhouse 2 | GT No. 7 (G-3407) | Turbine; Produces Electricity | Major | Major | Major | Small | Small | Sig. | Small |

| Process Unit | Source Identification (ID) | Unit Description | Emissions Unit Designation [1] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | $SO_2$ | $NO_X$ | CO | PM | $PM_{10}$ | $PM_{2.5}$ | VOC |
| Powerhouse 2 | GT No. 8 (G-3408) | Turbine; Produces Electricity | Major | Major | Major | Small | Sig. | Sig. | Small |
| Powerhouse 2 | GT No. 9 (G-3409) | Turbine; Produces Electricity | Sig. | Major | Small | Small | Sig. | Sig. | Small |
| Powerhouse 2 | GT No. 10 (G-3410) | Turbine; Produces Electricity | Sig. | Major | Small | Small | Small | Sig. | Small |
| GT No. 13 and Duct Burner | GT No. 13 (G-3413 & H-3413) | Turbine; Produces Electricity/Duct Burner; Produces Steam | Small | Major | Major | Sig. | Major | Major | Small |
| Tank | TK-01PR | Internal Floating Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-02PR | Internal Floating Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-03PR | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-04PR | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-05PR | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-06PR | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-07PR | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-0702 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-1061 | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-1062 | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-1063 | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-1064 | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-1065 | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-1066 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-1071 | External Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-1118 | Fixed Roof Tank | - | - | - | - | - | - | Small |

| Process Unit | Source Identification (ID) | Unit Description | Emissions Unit Designation [1] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | $SO_2$ | $NO_X$ | CO | PM | $PM_{10}$ | $PM_{2.5}$ | VOC |
| Tank | TK-1151 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-1156 | Internal Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-1157 | Internal Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-1201 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-1202 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-1203 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-1204 | Horizontal Tank | - | - | - | - | - | - | Small |
| Tank | TK-1205 | Horizontal Tank | - | - | - | - | - | - | Small |
| Tank | TK-1206 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-1207 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-1208 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-1236 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-1301 | Horizontal Tank | - | - | - | - | - | - | Small |
| Tank | TK-1302 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-1304 | Horizontal Tank | - | - | - | - | - | - | Small |
| Tank | TK-1305 | Horizontal Tank | - | - | - | - | - | - | Small |
| Tank | TK-1401 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-1600 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-1621 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-1622 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-1626 | Horizontal Tank | - | - | - | - | - | - | Small |
| Tank | TK-1627 | Horizontal Tank | - | - | - | - | - | - | Small |
| Tank | TK-1628 | Horizontal Tank | - | - | - | - | - | - | Small |
| Tank | TK-1629 | Horizontal Tank | - | - | - | - | - | - | Small |

| Process Unit | Source Identification (ID) | Unit Description | Emissions Unit Designation [1] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | $SO_2$ | $NO_X$ | CO | PM | $PM_{10}$ | $PM_{2.5}$ | VOC |
| Tank | TK-1630 | Horizontal Tank | - | - | - | - | - | - | Small |
| Tank | TK-1631 | Horizontal Tank | - | - | - | - | - | - | Small |
| Tank | TK-1632 | Horizontal Tank | - | - | - | - | - | - | Small |
| Tank | TK-1633 | Horizontal Tank | - | - | - | - | - | - | Small |
| Tank | TK-1653 | Horizontal Tank | - | - | - | - | - | - | Small |
| Tank | TK-1663 | External Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-2653 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-2654 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-3201 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-3202 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-3203 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-3204 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-3205 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-3208 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-3209 | Horizontal Tank | - | - | - | - | - | - | Small |
| Tank | TK-3301 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-3302 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-3303 | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-3304 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-3305 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-3306 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-3384 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-3385 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-3386 | Fixed Roof Tank | - | - | - | - | - | - | Small |

| Process Unit | Source Identification (ID) | Unit Description | Emissions Unit Designation [1] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | $SO_2$ | $NO_X$ | CO | PM | $PM_{10}$ | $PM_{2.5}$ | VOC |
| Tank | TK-4501 | Internal Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-4502 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-4503 | Internal Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-4761 | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-4762 | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-4763 | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-4764 | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-4765 | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-6801 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-6802 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-6803 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-6804 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-6805 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-6806 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-6807 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-6808 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-6809 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-6810 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6811 | Fixed Roof Tank | - | - | - | - | - | - | Small |

| Process Unit | Source Identification (ID) | Unit Description | Emissions Unit Designation [1] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | $SO_2$ | $NO_X$ | CO | PM | $PM_{10}$ | $PM_{2.5}$ | VOC |
| Tank | TK-6812 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6813 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6814 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-6815 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-6816 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-6817 | Fixed Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-6818 | Fixed Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-6819 | Fixed Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-6820 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6821 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6822 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6823 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6824 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6825 | Fixed Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-6831 | Internal Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6832 | Internal Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6833 | External Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6834 | External Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6835 | External Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6836 | External Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6837 | External Floating Roof Tank | - | - | - | - | - | - | Small |

| Process Unit | Source Identification (ID) | Unit Description | Emissions Unit Designation [1] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | $SO_2$ | $NO_X$ | CO | PM | $PM_{10}$ | $PM_{2.5}$ | VOC |
| Tank | TK-6838 | External Floating Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-6839 | External Floating Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-6840 | External Floating Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-6841 | Internal Floating Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-6842 | External Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6843 | Internal Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6851 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6852 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6853 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6854 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6856 | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-6857 | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-6858 | Fixed Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-6859 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6860 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6871 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6872 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6873 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6874 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6875 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6876 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6877 | Fixed Roof Tank | - | - | - | - | - | - | Small |

| Process Unit | Source Identification (ID) | Unit Description | Emissions Unit Designation [1] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | $SO_2$ | $NO_X$ | CO | PM | $PM_{10}$ | $PM_{2.5}$ | VOC |
| Tank | TK-6880 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6881 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6883 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6884 | Internal Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6887 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-6888 | Internal Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7051 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7201 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7202 | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-7206 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7207 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7208 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7209 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7210 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7211 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7301 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7302 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7401 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7402 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7403 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7404 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7405 | Fixed Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7406 | Fixed Roof Tank | - | - | - | - | - | - | Major |

| Process Unit | Source Identification (ID) | Unit Description | Emissions Unit Designation [1] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | $SO_2$ | $NO_X$ | CO | PM | $PM_{10}$ | $PM_{2.5}$ | VOC |
| Tank | TK-7407 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7408 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7409 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7410 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7411 | Fixed Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-7412 | Fixed Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-7413 | Fixed Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-7414 | Fixed Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-7415 | Fixed Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-7416 | Fixed Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-7417 | Internal Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7418 | Internal Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7421 | Fixed Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-7422 | Fixed Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-7423 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7424 | External Floating Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-7425 | Internal Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7426 | Internal Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7427 | Fixed Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-7428 | Fixed Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-7429 | Fixed Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-7430 | Fixed Roof Tank | - | - | - | - | - | - | Sig. |

| Process Unit | Source Identification (ID) | Unit Description | Emissions Unit Designation [1] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | $SO_2$ | $NO_X$ | CO | PM | $PM_{10}$ | $PM_{2.5}$ | VOC |
| Tank | TK-7431 | Internal Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7432 | Internal Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7433 | Internal Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7434 | Internal Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7435 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7436 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7437 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7438 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7439 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7440 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7441 | Internal Floating Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-7443 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7444 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7445 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7446 | Fixed Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7447 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7448 | Internal Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7449 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7451 | Internal Floating Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-7452 | Internal Floating Roof Tank | - | - | - | - | - | - | Sig. |

| Process Unit | Source Identification (ID) | Unit Description | Emissions Unit Designation [1] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | $SO_2$ | $NO_X$ | CO | PM | $PM_{10}$ | $PM_{2.5}$ | VOC |
| Tank | TK-7453 | Internal Floating Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-7454 | Internal Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7455 | External Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7456 | External Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7501 | Fixed Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-7502 | Fixed Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-7503 | Fixed Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-7504 | Fixed Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-7505 | Fixed Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-7506 | Fixed Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-7507 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7508 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7509 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7510 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7511 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7512 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7513 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7514 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7515 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7516 | External Floating Roof Tank | - | - | - | - | - | - | Major |

| Process Unit | Source Identification (ID) | Unit Description | Emissions Unit Designation [1] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | $SO_2$ | $NO_X$ | CO | PM | $PM_{10}$ | $PM_{2.5}$ | VOC |
| Tank | TK-7517 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7521 | Internal Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7522 | Internal Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7523 | Internal Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7524 | Internal Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7525 | Internal Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7526 | Internal Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7528 | Internal Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7541 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7542 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7571 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7601 | Internal Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7602 | Internal Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7603 | Internal Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7604 | Internal Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7605 | External Floating Roof Tank | - | - | - | - | - | - | Major |
| Tank | TK-7931 | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-7932 | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-7933 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7934 | Fixed Roof Tank | - | - | - | - | - | - | Small |

| Process Unit | Source Identification (ID) | Unit Description | Emissions Unit Designation [1] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | $SO_2$ | $NO_X$ | CO | PM | $PM_{10}$ | $PM_{2.5}$ | VOC |
| Tank | TK-7943 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7951 | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-7955 | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-7956 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7966 | Fixed Roof Tank (with Carbon Canisters) | - | - | - | - | - | - | Small |
| Tank | TK-7971 | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-7973 | External Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7974 | Internal Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-S-7974 | External Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7975 | External Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-S-7975 | External Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7976 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7977 | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-7978A | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-7978B | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-7979A | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-7979B | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-7981 | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-7982 | Open Roof Tank | Water Tank - No Emissions | | | | | | |

| Process Unit | Source Identification (ID) | Unit Description | Emissions Unit Designation [1] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | $SO_2$ | $NO_X$ | CO | PM | $PM_{10}$ | $PM_{2.5}$ | VOC |
| Tank | TK-7983 | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-7984 | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-7986 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-7987 | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-7988 | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-8001 | Internal Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-8002 | Internal Floating Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-8501 | Fixed Roof Tank | - | - | - | - | - | - | Sig. |
| Tank | TK-8502 | Open Roof Tank | Water Tank - No Emissions | | | | | | |
| Tank | TK-8503 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-8505 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-8508 | Horizontal Tank | - | - | - | - | - | - | Small |
| Tank | TK-8511 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-8701 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | UTT1 | Fixed Roof Tank | - | - | - | - | - | - | Small |
| Tank | TK-D290 (frmly D1301) | Horizontal Tank | - | - | - | - | - | - | Small |
| Tank | TKD-1609 | Horizontal Tank | - | - | - | - | - | - | Small |
| Tank | TKD-1610 | Horizontal Tank | - | - | - | - | - | - | Small |
| Seawater and Desalination Water Pumps | PD-1602 | Reciprocating engine driver for seawater intake pump | Small | Small | Small | Small | Small | Small | Small |
| Seawater and Desalination Water Pumps | PD-1603 | Reciprocating engine driver for seawater intake pump | Small | Small | Small | Small | Small | Small | Small |

| Process Unit | Source Identification (ID) | Unit Description | Emissions Unit Designation [1] | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | $SO_2$ | $NO_X$ | CO | PM | $PM_{10}$ | $PM_{2.5}$ | VOC |
| Seawater and Desalination Water Pumps | PD-1604 | Reciprocating engine driver for seawater intake pump | Small | Small | Small | Small | Small | Small | Small |
| Seawater and Desalination Water Pumps | PD-1605 | Reciprocating engine driver for seawater intake pump | Small | Small | Small | Small | Small | Small | Small |
| Seawater and Desalination Water Pumps | PD-1620 | Reciprocating engine driver for seawater intake pump | Small | Small | Small | Small | Small | Small | Small |
| Marine Loading | Unit No. 1600 | Ship loading and unloading | Small | Small | Small | Small | Small | Small | Major |
| Truck loading rack | Unit No. 1651 | Dispense liquid and gaseous fuel to tank trucks | - | - | - | - | - | - | Small |
| Fuel pumps | Gasoline Service Station | Dispense gasoline and diesel | - | - | - | - | - | - | Small |
| East fuel gas system | Unit No. 1902 | East fuel gas system | - | - | - | - | - | - | Small |
| West fuel gas system | Unit No. 3303 | West fuel gas system | - | - | - | - | - | - | Small |
| Vapor Enhanced Recovery System | VER 1 | Extracts liquids & air from groundwater wells to remediate contaminated soils & groundwater | Permanently shut down emissions unit [1] | | | | | | |
| Vapor Enhanced Recovery System | VER 2 | Extracts liquids & air from groundwater wells to remediate contaminated soils & groundwater | Permanently shut down emissions unit [2] | | | | | | |

(1) A "-" denotes that a given pollutant is not emitted from that emissions unit.
(2) In accordance with 40 CFR 52.21(aa)(6)(i), emissions associated with units that were permanently shut down after the baseline period must be subtracted from the PAL level. As a result, these units are identified here and omitted from the remainder of this application.
(3) Lagoons #1, #2 and #3 were removed from Wastewater Treatment in 2008
(4) Units are not in VOC service.

## 3.0 IDENTIFICATION OF APPLICABLE REQUIREMENTS

In accordance with 40 CFR 52.21(aa)(3)(i), Table 3-1 presents a listing of applicable requirements, including emission limitations and work practices, for each of the emissions units identified in Table 2-2. Applicable requirements that do not have the effect or possible effect of limiting PAL pollutant emissions (*e.g.,* recordkeeping and reporting requirements), and thus do not factor into the calculation of baseline actual emissions as described in Section 4.0, are not listed in Table 3-1.

**Table 3-1. Summary of Emissions Unit Federal/Territory Applicable Requirements, Emission Limits, and Work Practices**

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| #2DU Fractionator | #2 DU Process Unit | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| #2 DU Fractionator | H-101 | Heater | $SO_2$ | Emissions Limit | • Oil max S content 0.55 wt% (anytime), 0.5 wt% (365-day), and 0.3 wt% (scenario dependent)<br>• Oil max S content 0.5 wt% or 1.0 wt% (scenario dependent)<br>• H-101 & H-104 max oil 146,511 or 136,327 bbls/yr (scenario dependent)<br>• Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶¶ 37 & 38<br>• 2011 FCCU PSD Permit (III)(C)(c), (d), & (e)<br>• 2011 FCCU PSD Permit (III)(C)(c), (d), & (e)<br>• HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |
| | | | PM | Emissions Limit | • 0.34 lb/mmBtu | • VIRR 12-09-204-23(b)(4) |
| #2 DU Fractionator | H-104 | Heater | $SO_2$ | Emissions Limit | • Oil max S content 0.55 wt% (anytime), 0.5 wt% (365-day), and 0.3 wt% (scenario dependent)<br>• Oil max S content 0.5 wt% or 1.0 wt% (scenario dependent)<br>• H-101 & H-104 max oil 146,511 or 136,327 bbls/yr (scenario dependent)<br>• Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶¶ 37 & 38<br>• 2011 FCCU PSD Permit (III)(C)(c), (d), & (e)<br>• 2011 FCCU PSD Permit (III)(C)(c), (d), & (e)<br>• HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |
| | | | PM | Emissions Limit | • 0.36 lb/mmBtu | • VIRR 12-09-204-23(b)(4) |
| #2 CDU | #2 CDU Process Unit | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| #2 CDU | H-401A | Charge Heater | $SO_2$ | Emissions Limit | • Oil max S content 0.55 wt% (anytime), 0.5 wt% (365-day), and 0.3 wt% (scenario dependent)<br>• Oil max S content 0.5 wt% or 1.0 wt% (scenario dependent)<br>• H-401A, B & C max oil 327,186 or 92,637 bbls/yr (scenario dependent)<br>• Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶¶ 37 & 38<br>• 2011 FCCU PSD Permit (III)(C)(c), (d), & (e)<br>• 2011 FCCU PSD Permit (III)(C)(c), (d), & (e)<br>• HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |
| | | | PM | Emissions Limit | • 0.33 lb/mmBtu | • VIRR 12-09-204-23(b)(4) |
| #2 CDU | H-401B | Charge Heater | $SO_2$ | Emissions Limit | • Oil max S content 0.55 wt% (anytime), 0.5 wt% (365-day), and 0.3 wt% (scenario dependent)<br>• Oil max S content 0.5 wt% or 1.0 wt% (scenario dependent)<br>• H-401A, B & C max oil 327,186 or 92,637 bbls/yr (scenario dependent)<br>• Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶¶ 37 & 38<br>• 2011 FCCU PSD Permit (III)(C)(c), (d), & (e)<br>• 2011 FCCU PSD Permit (III)(C)(c), (d), & (e)<br>• HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |
| | | | PM | Emissions Limit | • 0.33 lb/mmBtu | • VIRR 12-09-204-23(b)(4) |
| #2 CDU | H-401C | Charge Heater | $SO_2$ | Emissions Limit | • Oil max S content 0.55 wt% (anytime), 0.5 wt% (365-day) and 0.3 wt% (scenario dependent)<br>• Oil max S content 0.5 wt% or 1.0 wt% (scenario dependent)<br>• H-401A, B & C max oil 327,186 or 92,637 bbls/yr (scenario dependent)<br>• Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶37<br>• 2011 FCCU PSD Permit (III)(C)(c), (d), & (e)<br>• 2011 FCCU PSD Permit (III)(C)(c), (d), & (e)<br>• HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |
| | | | PM | Emissions Limit | • 0.33 lb/mmBtu | • VIRR 12-09-204-23(b)(4) |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| #3 CDU/1 VAC | #3 CDU & 1 VAC Process Unit | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| #3 DD | #3 DD | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| #3 DD | C-1500A | Reciprocating Gas Compressor | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |
| #3 DD | C-1500B | Reciprocating Gas Compressor | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |
| #3 DD | C-1500C | Reciprocating Gas Compressor | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |
| Penex | Penex Process Unit | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| Penex | H-200 | Charge Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |
| Penex | H-201 | Fired Reboiler Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |
| Penex | H-202 | Hot Oil Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |
| Penex | C-200A | Reciprocating Gas Compressor | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |
| | | | $NO_X$ | Emissions Limit | • 0.86 lbs/mmBtu | • STX-557A-E-02(IX)(D), June 4, 2002 |
| | | | CO | Emissions Limit | • 7.06 lbs/mmBtu | • STX-557A-E-02(IX)(E), June 4, 2002 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| Penex | C-200B | Reciprocating Gas Compressor | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |
| | | | $NO_X$ | Emissions Limit | • 0.86 lbs/mmBtu | • STX-557A-E-02(IX)(D), June 4, 2002 |
| | | | CO | Emissions Limit | • 7.06 lbs/mmBtu | • STX-557A-E-02(IX)(E), June 4, 2002 |
| Penex | C-200C | Reciprocating Gas Compressor | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |
| | | | $NO_X$ | Emissions Limit | • 0.86 lbs/mmBtu | • STX-557A-E-02(IX)(D), June 4, 2002 |
| | | | CO | Emissions Limit | • 7.06 lbs/mmBtu | • STX-557A-E-02(IX)(E), June 4, 2002 |
| #3 Amine | Unit No. 0920 | Process Fugitives | VOC | Work Practice | • Work Practice Requirement | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| Utility Fractionation | Utility Fractionation Process Unit | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| Utility Fractionation | H-160 | Charge Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |
| #2 Platformer | #2 Platformer Process Unit | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| #2 Platformer | H-601 | Stripper Reboiler Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |
| #2 Platformer | H-604 | Platforming No. 2 Interheater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| #2 Platformer | H-605 | Platforming No. 3 Interheater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |
| #2 DU | #2 DU Process Unit | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| #2 DU | H-800A | Reactor Charge Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |
| #2 DU | H-800B | Reactor Charge Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |
| #2 DU | H-801 | Stripper Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |
| #2 VAC | #2 VAC Process Unit | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| #2 VIS | #2 VIS Process Unit | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| #4 DD | #4 DD Process Unit | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| #4 DD | H-2201A | Reactor Charge Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |
| #4 DD | H-2201B | Reactor Charge Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |
| #4 DD | H-2202 | Stripper Reboiler Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |
| #5 DD | #5 DD Process Unit | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| #5 DD | H-2400 | Charge Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |
| #5 DD | C-2400A | Reciprocating Gas Compressor | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |
| | | | $NO_X$ | Emissions Limit | • 0.67 lb/mmBtu | • STX-557A-E-02(IX)(B), June 4, 2002 |
| | | | CO | Emissions Limit | • 2.40 lb/mmBtu | • STX-557A-E-02(IX)(C), June 4, 2002 |
| #5 DD | C-2400B | Reciprocating Gas Compressor | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |
| | | | $NO_X$ | Emissions Limit | 0.67 lb/mmBtu | • STX-557A-E-02(IX)(B), June 4, 2002 |
| | | | CO | Emissions Limit | 2.40 lb/mmBtu | • STX-557A-E-02(IX)(C), June 4, 2002 |
| Naphtha Fractionation | Naphtha Frac. Process Unit | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| Naphtha Fractionation | H-2501 | Reboiler Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |
| #2 Platformer | #2 Plat Vent | Plat No. 2 Catalyst Regen Vent | VOC | Design Requirement | • 98% TOC control | • 40 CFR 63 subpart A and UUU |
| #2 Sulfolane | #2 Sulfolane Process Unit | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subparts A, H, & CC |
| #2 Sulfolane | H-4502 | Benzene Column Reboiler Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |
| #2 Sulfolane | H-4503 | Toluene Column Reboiler Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| #2 Sulfolane | H-4504 | Xylene Column Reboiler Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |
| #2 Sulfolane | H-4505 | Raffinate Splitter Reboiler Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |
| #5 CDU | #5 CDU Process Unit | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| #5 CDU | H-3101A | Crude Charge Heater | $SO_2$ | Emissions Limit | • Oil max S content 0.55 wt% (anytime), 0.5 wt% (365-day) and 0.3 wt% (scenario dependent)<br>• Oil max S content 0.5 wt% or 1.0 wt% (scenario dependent)<br>• H-3101A & 3101B max oil 413,910 or 397,485 bbls/yr (scenario dependent)<br>• Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶¶ 37 & 38<br>• 2011 FCCU PSD Permit (III)(C)(c), (d), & (e)<br>• 2011 FCCU PSD Permit (III)(C)(c), (d) & (e)<br>• HOVENSA CD ¶34 |
| | | | PM | Emissions Limit | • 0.28 lb/mmBtu | • VIRR 12-09-204-23(b)(4) |
| #5 CDU | H-3101B | Crude Charge Heater | $SO_2$ | Emissions Limit | • Oil max S content 0.55 wt% (anytime), 0.5 wt% (365-day) and 0.3 wt% (scenario dependent)<br>• Oil max S content 0.5 wt% or 1.0 wt% (scenario dependent)<br>• H-3101A & 3101B max oil 413,910 or 397,485 bbls/yr (scenario dependent)<br>• Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶¶ 37 & 38<br>• 2011 FCCU PSD Permit (III)(C)(c), (d), & (e)<br>• 2011 FCCU PSD Permit (III)(C)(c)(d) & (e)<br>• HOVENSA CD ¶34 |
| | | | PM | Emissions Limit | • 0.28 lb/mmBtu | • VIRR 12-09-204-23(b)(4) |
| #6 CDU | #6 CDU Process Unit | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| #6 CDU | H-4101A | Crude Charge Heater | $SO_2$ | Emissions Limit | • Oil max S content 0.55 wt% (anytime), 0.5 wt% (365-day) and 0.3 wt% (scenario dependent)<br>• Oil max S content 0.5 wt% or 1.0 wt% (scenario dependent)<br>• H-3101A & 3101B max oil 413,910 or 397,485 bbls/yr (scenario dependent)<br>• Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶¶ 37 & 38<br>• 2011 FCCU PSD Permit (III)(C)(c), (d), & (e)<br>• 2011 FCCU PSD Permit (III)(C)(d) & (e)<br>• HOVENSA CD ¶34 |
| | | | PM | Emissions Limit | • 0.28 lb/mmBtu | • VIRR 12-09-204-23(b)(4) |
| #6 CDU | H-4101B | Crude Charge Heater | $SO_2$ | Emissions Limit | • Oil max S content 0.55 wt% (anytime), 0.5 wt% (365-day) and 0.3 wt% (scenario dependent)<br>• Oil max S content 0.5 wt% or 1.0 wt% (scenario dependent)<br>• H-3101A & 3101B max oil 413,910 or 397,485 bbls/yr (scenario dependent)<br>• Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶¶ 37 & 38<br>• 2011 FCCU PSD Permit (III)(C)(c), (d), & (e)<br>• 2011 FCCU PSD Permit (III)(C)(d) & (e)<br>• HOVENSA CD ¶34 |
| | | | PM | Emissions Limit | • 0.28 lb/mmBtu | • VIRR 12-09-204-23(b)(4) |
| Disulfide | Disulfide Process Unit | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • 40 HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| #3 Platformer | #3 Platformer Process Unit | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| #3 Platformer | H-4401 | Charge Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |
| #3 Platformer | H-4402 | Fired Reboiler Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| #3 Platformer | H-4451 | Charge Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |
| #3 Platformer | H-4452 | Intermediate Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |
| #3 Platformer | H-4453 | Intermediate Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |
| #3 Platformer | H-4454 | Intermediate Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |
| #3 Platformer | H-4455 | Fired Reboiler Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |
| #3 VAC | #3 VAC Process Unit | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| #3 VAC | H-4201 | Prestripper Heater | $SO_2$ | Emissions Limit | • Oil max S content 0.55 wt% (anytime), 0.5 wt% (365-day) and 0.3 wt% (scenario dependent)<br>• Oil max S content 0.5 wt% or 1.0 wt% (scenario dependent)<br>• H-4201 & 4202 max oil 418,181 or 339,998 bbls/yr (scenario dependent)<br>• Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶¶ 37 & 38<br>• 2011 FCCU PSD Permit (III)(C)(c), (d), & (e)<br>• 2011 FCCU PSD Permit (III)(C)(c)(d) & (e)<br>• HOVENSA CD ¶34 |
| | | | PM | Emissions Limit | • 0.30 lb/mmBtu | • VIRR 12-09-204-23(b)(4) |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| #3 VAC | H-4202 | Vacuum Heater | $SO_2$ | Emissions Limit | • Oil max S content 0.55 wt% (anytime), 0.5 wt% (365-day) and 0.3 wt% (scenario dependent)<br>• Oil max S content 0.5 wt% or 1.0 wt% (scenario dependent)<br>• H-4201 & 4202 max oil 418,181 or 339,998 bbls/yr (scenario dependent)<br>• Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶¶ 37 & 38<br>• 2011 FCCU PSD Permit (III)(C)(c), (d), & (e)<br>• 2011 FCCU PSD Permit (III)(C)(d) & (e)<br>• HOVENSA CD ¶34 |
| | | | PM | Emissions Limit | • 0.30 lb/mmBtu | • VIRR 12-09-204-23(b)(4) |
| #4 Platformer | #4 Platformer Process Unit | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| #4 Platformer | H-5401 | Charge Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |
| #4 Platformer | H-5402 | Fired Reboiler Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |
| #4 Platformer | H-5451 | Charge Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |
| #4 Platformer | H-5452 | Intermediate Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |
| #4 Platformer | H-5453 | Intermediate Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |
| #4 Platformer | H-5454 | Intermediate Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |
| #4 Platformer | H-5455 | Fired Reboiler Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |
| #6 DD | #6 DD Process Unit | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| #6 DD | H-4601A | Reactor Charge Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| #6 DD | H-4601B | Reactor Charge Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |
| #6 DD | H-4602 | Stripper Reboiler Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |
| #6 DD | C-4601A | Reciprocating Gas Compressor | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |
| #6 DD | C-4601B | Reciprocating Gas Compressor | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |
| #6 DD | C-4601C | Reciprocating Gas Compressor | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |
| #7 DD | #7 DD Process Unit | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| #7 DD | H-4301A | Reactor Charge Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |
| #7 DD | H-4301B | Reactor Charge Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |
| #7 DD | H-4302 | Stripper Reboiler Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |
| #9 DD | #9 DD Process Unit | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| #9 DD | H-5301A | Reactor Charge Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |
| #9 DD | H-5301B | Reactor Charge Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |
| #9 DD | H-5302 | Stripper Reboiler Heater | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |
| LSG Unit | LSG Unit Process Unit | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • 40 CFR 60 subpart A & GGG/VV<br>• HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| LSG Unit | H-4901 | Charge Heater | All | Operating Requirement | • Max heat input 87.3 mmBtu/hr | • LSFP PSD Permit VI.B.1 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| | | | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr)<br>• 75 ppmvd $H_2S$ (24-hr)<br>• 2.1 lb/hr (3-hr)<br>• 23.0 lb/hr (24-hr)<br>• 4.2 TPY | • LSFP PSD Permit VII.B.1, 40 CFR 60 subpart A & J, and HOVENSA CD ¶34<br>• LSFP PSD Permit VII.B.1<br>• LSFP PSD Permit VIII.B.2<br>• LSFP PSD Permit VIII.B.2<br>• LSFP PSD Permit VIII.B.2 |
| | | | $NO_X$ | Emissions Limit | • 0.007 lb/mmBtu (3-hr)<br>• 0.61 lb/hr (3-hr<br>• 2.4 lb/hr (startup)<br>• 2.7 TPY (365-day) | • LSFP PSD Permit VIII.B.3<br>• LSFP PSD Permit VIII.B.3<br>• LSFP PSD Permit VIII.B.3<br>• LSFP PSD Permit VIII.B.3 |
| | | | CO | Emissions Limit | • 0.04 lb/mmBtu | • LSFP PSD Permit VIII.B.4 |
| | | | $PM/PM_{10}$ | Emissions Limit | • 0.82 lb/hr<br>• 3.6 TPY | • LSFP PSD Permit VIII.B.1<br>• LSFP PSD Permit VIII.B.1 |
| #3 Platformer | #3 Plat Vent | Plat No. 3 Catalyst Regen Vent | VOC | Design Requirement | 98% TOC control | 40 CFR 63 subpart A and UUU |
| #4 Platformer | #4 Plat Vent | Plat No. 4 Catalyst Regen Vent | VOC | Design Requirement | 98% TOC control | 40 CFR 63 subpart A and UUU |
| Alkylation Unit | Unit No. 7200 | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • 40 CFR 60 subpart A & GGG/VV<br>• HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| Dimersol Unit | Unit No. 7300 | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • 40 CFR 60 subpart A & GGG/VV<br>• HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| FCCU & Gas Concentration | FCCU & Unit No. 7100 | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • 40 CFR 60 subpart A & GGG/VV<br>• HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| FCCU | FCCU stack STK-7051 | Fluid Catalytic Cracking | All | Emissions Limit | • 58,400,000 bbl/yr (365-day)<br>• 165,000 bbl/day<br>• 115,500 lb coke burn-off/hr | • LSFP PSD Permit VI.C.1<br>• LSFP PSD Permit VI.C.2<br>• LSFP PSD Permit VI.C.3 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| | | | $SO_2$ | Emissions Limit | • 0.6 wt% feedstock sulfur content<br>• 16 ppmvd @ 0% $O_2$ (365-day)<br>• 25 ppmvd @ 0% $O_2$ (7-day)<br>• 90% $SO_2$ reduction across scrubber<br>• 214.9 lb/hr (3-hr)<br>• 237 TPY (12-mth)<br>• 50 ppmvd @ 0% $O_2$ (7-day) | • LSFP PSD Permit VII.C.1<br>• LSFP PSD Permit VIII.C.3.a<br>• LSFP PSD Permit VII.C.3.b<br>• LSFP PSD Permit VII.C.3.c<br>• LSFP PSD Permit VII.C.3.d<br>• LSFP PSD Permit VII.C.3.d<br>• 40 CFR 60 subpart A & J |
| | | | $NO_X$ | Emissions Limit | • 20 ppmvd @ 0% $O_2$ (365-day)<br>• 40 ppmvd @ 0% $O_2$ (7-day) excluding startup, shutdown, and malfunction<br>• 25 ppmvd @ 0% $O_2$ (365-day)<br>• 266 TPY | • HOVENSA CD ¶11<br>• HOVENSA CD ¶11<br>• LSFP PSD Permit VIII.C.4.a<br>• LSFP PSD Permit VIII.C.4.b |
| | | | CO | Emissions Limit | • 500 ppmvd (hourly)<br>• 432 ppmvd @ 7% $O_2$ (hourly)<br>• 738.6 lb/hr (hourly)<br>• 3,235 TPY | • 40 CFR 60 subpart A & J<br>• LSFP PSD Permit VIII.C.5.a<br>• LSFP PSD Permit VII.C.5.b<br>• LSFP PSD Permit VII.C.5.b |
| | | | PM | Emissions Limit | • 0.5 lb/1000 lb coke burn-off<br>• 57.75 lb/hr<br>• 252.9 TPY<br>• 2.0 lb/ton coke burn-off | • LSFP PSD Permit VIII.C.1<br>• LSFP PSD Permit VIII.C.1<br>• LSFP PSD Permit VIII.C.1<br>• 40 CFR 60 subpart A & J |
| | | | $PM_{10}$ | Emissions Limit | • 1.0 lb/1000 lb coke burn-off<br>• 115.5 lb/hr<br>• 505.9 TPY | • LSFP PSD Permit VIII.C.2<br>• LSFP PSD Permit VIII.C.2<br>• LSFP PSD Permit VIII.C.2 |
| | | | VOC | Emissions Limit | • 20 ppmvd @ 7% $O_2$<br>• 12.1 lb/hr<br>• 52.7 TPY | • LSFP PSD Permit VIII.C.6.a<br>• LSFP PSD Permit VIII.C.6.a<br>• LSFP PSD Permit VIII.C.6.a |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| Deiso-Hexanizer | Deiso-Hexanizer Process Unit | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| #3, 4, 5 Amine and T-931 | #3, 4, 5 Amine Process Unit | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| #6 & 7 Amine and SHU | Unit Nos. 7450 & 7600 | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| Merox Unit | Unit No. 7500 | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| 1&2 GRU/$H_2$ CON | 1&2 GRU/ $H_2$ CON | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| 1&2 LPG Treater | 1&2 LPG Treater | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| 3 LPG Fractionator | 3 LPG Fractionator | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| Light Ends Treater | Light Ends Treater | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| MTBE | MTBE | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A, H & CC |
| TAME | TAME | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A, H & CC |
| Selective Hydrogenation Unit | Selective Hydro | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| 1 Beavon / 1&2 SRU | 1 Beavon / 1&2 SRU | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| 2 Beavon / 3&4 SRU | 2 Beavon / 3&4 SRU | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| SRU | SRU | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| 3 SWS | 3 SWS | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| 4 SWS | 4 SWS | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| 5 SWS | 5 SWS | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| 6 SWS | 6 SWS | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| East Fuel Gas System | East Fuel Gas System | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| West Fuel Gas System | West Fuel Gas System | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| Terminal | Terminal (Offsites/ Rundowns/ xfers) | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| Sulfuric Acid Plant | STK-7801 (H-7801, H-7802, & R-7801) | Heater Stack (Process Air Heater, Converter Heater & Startup Heater) | All | Emissions Limit | • Max. heat input 42 mmBtu/hr | • 2011 FCCU PSD Permit III.A. |
| | | | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr)<br>• 0.79 lb/hr<br>• 3.2 TPY<br>• 11 ppmv @ 7% $O_2$ | • 40 CFR 60 subpart A & J, 2011 FCCU PSD Permit III.A and HOVENSA CD ¶34<br>• 2011 FCCU PSD Permit III.A.a<br>• 2011 FCCU PSD Permit III.A.a<br>• 2011 FCCU PSD Permit III.A.a |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| | | | $NO_X$ | Emissions Limit | • 0.14 lb/mmBtu<br>• 4.6 lb/hr<br>• 18.4 TPY<br>• 96 ppmvd @ 7% $O_2$ | • 2011 FCCU PSD Permit III.A.c.1<br>• 2011 FCCU PSD Permit III.A.c.1<br>• 2011 FCCU PSD Permit III.A.c.1<br>• 2011 FCCU PSD Permit III.A.c.1 |
| | | | CO | Emissions Limit | • 0.03 lb/mmBtu<br>• 1.3 lb/hr<br>• 3.9 TPY<br>• 32 ppmvd @ 7% $O_2$ | • 2011 FCCU PSD Permit III.A.d.<br>• 2011 FCCU PSD Permit III.A.d.<br>• 2011 FCCU PSD Permit III.A.d.<br>• 2011 FCCU PSD Permit III.A.d. |
| | | | $PM_{10}$ | Emissions Limit | • 0.1 lb/mmBtu<br>• 4.2 lb/hr<br>• 13.4 TPY | • 2011 FCCU PSD Permit III.A.b.<br>• 2011 FCCU PSD Permit III.A.b<br>• 2011 FCCU PSD Permit III.A.b |
| | | | VOC | Emissions Limit | • 0.1 lb/hr<br>• 0.32 TPY<br>• 5 ppmv @ 7% $O_2$ (as methane) | • 2011 FCCU PSD Permit III.A.e.<br>• 2011 FCCU PSD Permit III.A.e.<br>• 2011 FCCU PSD Permit III.A.e. |
| Sulfuric Acid Plant | STK-7802 | Process Stack | All | Emissions Limit | Max 320 tons acid/day | • 2011 FCCU PSD Permit II.A. |
| | | | $SO_2$ | Emissions Limit | • 4 lb/ton acid produced<br>• 45.8 lbs/hr<br>• 201 TPY<br>• 375 ppmvd @ 7% $O_2$ | • 2011 FCCU PSD Permit II.B.a.<br>• 2011 FCCU PSD Permit II.B.a.<br>• 2011 FCCU PSD Permit II.B.a.<br>• 2011 FCCU PSD Permit II.B.b. |
| | | | $NO_x$ | Emissions Limit | • 12.2 lb/hr<br>• 200 ppmvd @7% $O_2$<br>• 53.4 TPY | • 2011 FCCU PSD Permit II.C.<br>• 2011 FCCU PSD Permit II.C.<br>• 2011 FCCU PSD Permit II.C. |
| West Sulfur Recovery | Unit Nos. 1030 & 1040, H-1061, T-1061, H-1032, H-1042 & | Sulfur Recovery and Tail Gas Treatment Units | $SO_2$ | Emissions Limit | • 30 ton/day combined for H-1032, H-1042 & H-4745<br>• 250 ppmvd @ 0% $O_2$ for each H-1032, H-1042 & H-1061 | • 2011 FCCU PSD Permit IV.D.b<br>• HOVENSA CD ¶34 |
| | | | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| | Beavon CT #1 | | PM | Emissions Limit | • 0.03 gr/dscf | • VIRR 12-09-204-23(c) |
| | | | $H_2S$ (Beavon) | Emissions Limit | • 50 ppm | • VIRR 12-09-204-45 |
| East Sulfur Recovery | Unit Nos. 4740 & 4750, H-4761, T-4761, H-4745 & Beavon CT #2 | Sulfur Recovery and Tail Gas Treatment Units | $SO_2$ | Emissions Limit | • 30 ton/day combined for H-1032, H-1042 & H-4745<br>• 250 ppmvd @ 0% $O_2$ for each H-4745 & H-4761 | • 2011 FCCU PSD Permit (IV)(D)<br>• HOVENSA CD ¶34 |
| | | | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 0.1 gr/dscf (3-hr) | • HOVENSA CD ¶34 |
| | | | PM | Emissions Limit | • 0.03 gr/dscf | • VIRR 12-09-204-23(c) |
| West Refinery Process Drains | Oily Water Collection System | Process Drain Fugitives | VOC | Design/Work Practice | | • 40 CFR 61 subparts A & FF<br>• 40 CFR 63 subparts A & CC |
| East Refinery Process Drains | Oily Water Collection System | Process Drain Fugitives | VOC | Design/Work Practice | | • 40 CFR 61 subparts A & FF<br>• 40 CFR 63 subparts A & CC |
| FCC Complex / Delayed Coker Unit/LSF Unit | Oily Water Collection System | Process Drain Fugitives | VOC | Design/Work Practice | | • 40 CFR 60 Subparts A & QQQ<br>• 40 CFR 61 subparts A & FF<br>• 40 CFR 63 subparts A & CC |
| Terminal | Oily Water Collection System | Process Drain Fugitives | VOC | Design/Work Practice | | • 40 CFR 60 Subparts A & QQQ<br>• 40 CFR 61 subparts A & FF<br>• 40 CFR 63 subparts A & CC |
| Advanced Wastewater Treatment System | #1 API (Unit No. 1660) | Oil/Water Separator | VOC | Design/Work Practice | | • 40 CFR 60 subpart A & QQQ<br>• 40 CFR 61 subparts A & FF<br>• 40 CFR 63 subparts A & CC |
| | #1 WEMCO | Induced Air Floatation Unit | VOC | Design/Work Practice | | • 40 CFR 61 subpart A & FF<br>• 40 CFR 63 subparts A & CC |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| | #2 API (Unit No. 1661) | Oil/Water Separator | VOC | Design/Work Practice | | • 40 CFR 60 subpart A &QQQ<br>• 40 CFR 61 subparts A & FF<br>• 40 CFR 63 subparts A & CC |
| | #2 WEMCO | Induced air floatation unit | VOC | Design/Work Practice | | • 40 CFR 61 subpart A & FF<br>• 40 CFR 63 subparts A & CC |
| | West Benzene Stripper (STK-3510) | Air Stripper | VOC | Design/Work Practice | | • 40 CFR 61 subpart A & FF<br>• 40 CFR 63 subparts A & CC |
| | #3 API (Unit No. 1662) | Oil/Water Separator | VOC | Design/Work Practice | | • 40 CFR 61 subpart A & FF<br>• 40 CFR 63 subparts A & CC |
| | #3 WEMCO | Induced air floatation unit | VOC | Design/Work Practice | | • 40 CFR 61 subpart A & FF<br>• 40 CFR 63 subparts A & CC |
| | East Benzene Stripper (STK-3530) | Air Stripper | VOC | Design/Work Practice | | • 40 CFR 61 subpart A & FF<br>• 40 CFR 63 subparts A & CC |
| West Sulfur Storage Area | Materials Handling | Materials Handling | PM / $PM_{10}$ / $PM_{2.5}$ | N/A | N/A | N/A |
| East Sulfur Storage Area | Materials Handling | Materials Handling | PM / $PM_{10}$ / $PM_{2.5}$ | N/A | N/A | N/A |
| Sulfur Storage, Handling & Shipping | Materials Handling | Materials Handling | PM / $PM_{10}$ / $PM_{2.5}$ | N/A | N/A | N/A |
| Catalyst Handling | Materials Handling | Material Handling | PM / $PM_{10}$ / $PM_{2.5}$ | N/A | N/A | N/A |
| Road Dust | Road Dust | Road Dust | PM / $PM_{10}$ / $PM_{2.5}$ | Design/Work Practice | Paving and general upkeep to minimize emissions | VIRR 12-09-204-25(a) |
| Painting | Painting | Painting | VOC | N/A | N/A | N/A |
| Firefighter Training | Firefighter Training | Firefighter Training | CO, NOx, PM / $PM_{10}$ / $PM_{2.5}$, VOC | N/A | N/A | N/A |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| West-side Refinery Flare System | #2 Flare (H-1105) & #3 Flare (H-1104) | Gas burner, steam assisted | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr) | • HOVENSA CD ¶34 |
| East-side Refinery Flare System | #5 Flare (H-3351), #6 Flare (H-3352), & #7 Flare (H-3301) | Gas burner, steam assisted | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr) | • HOVENSA CD ¶34 |
| Tank 7921 Flare System | LPG Flare (STK 7921) | Gas burner, steam assisted | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr) | • HOVENSA CD ¶34 |
| FCC/Coker Refinery Flare System | FCC Flare (L.P. Flare - STK 7941) | Gas burner, steam assisted | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr) | • HOVENSA CD ¶34 |
| | Ground Flare (H.P. Flare - STK 7942) | Gas burner | $SO_2$ | Emissions Limit | • Fuel gas $H_2S$ 162 ppmv (3-hr) | • HOVENSA CD ¶34 |
| Delayed Coker Unit | Delayed Coker Unit Process Unit | Process Fugitives | VOC | Work Practice | • Work Practice Requirements | • 40 CFR 60 subpart A & GGG/VV<br>• HOVENSA CD ¶¶ 101 & 109<br>• 40 CFR 63 subpart A & CC |
| Delayed Coker Unit | | Delayed Coking Unit | All | Operating Limit | • 21,170,000 bbl/yr | • [STX-557A-E-02(II)(C), June 4, 2002 |
| | H-8501A | Coker Process Heater 1 | $SO_2$ | Emissions Limit | • 75 ppmv $H_2S$ (3-hr)<br>• 2.2 lb/hr (365-day)<br>• 0.1 gr/dscf $H_2S$ (3-hr) | • STX-557A-E-02(III)(A), June 4, 2002<br>• STX-557A-E-02(III)(A), June 4, 2002<br>• 40 CFR 60 subpart A & J and HOVENSA CD ¶34 |
| | | | $NO_X$ | Emissions Limit | • 0.07 lb/mmBtu<br>• 13.7 lb/hr | • STX-557A-E-02(III)(B), June 4, 2002<br>• STX-557A-E-02(III)(B), June 4, 2002 |
| | | | CO | Emissions Limit | • 0.03 lb/mmBtu<br>• 5.9 lb/hr | • HOVENSA CD Appendix H<br>• STX-557A-E-02(III)(C), June 4, 2002 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| | | | $PM/PM_{10}$ | Emissions Limit | • 0.6 lb/hr (365-day) | • STX-557A-E-02(III)(E), June 4, 2002 |
| | | | VOC | Emissions Limit | • 0.005 lb/mmBtu<br>• 1.0 lb/hr (365-day) | • HOVENSA CD Appendix H<br>• STX-557A-E-02(III)(D), June 4, 2002 |
| Delayed Coker Unit | H-8501B | Coker Process Heater 2 | $SO_2$ | Emissions Limit | • 75 ppmv $H_2S$ (3-hr)<br>• 2.2 lb/hr (365-day)<br>• 0.1 gr/dscf $H_2S$ (3-hr) | • STX-557A-E-02(III)(A), June 4, 2002<br>• STX-557A-E-02(III)(A), June 4, 2002<br>• 40 CFR 60 subpart A & J and HOVENSA CD ¶34 |
| | | | $NO_X$ | Emissions Limit | • 0.07 lb/mmBtu<br>• 13.7 lb/hr | • STX-557A-E-02(III)(B), June 4, 2002<br>• STX-557A-E-02(III)(B), June 4, 2002 |
| | | | CO | Emissions Limit | • 0.03 lb/mmBtu<br>• 5.9 lb/hr | • HOVENSA CD Appendix H<br>• STX-557A-E-02(III)(C), June 4, 2002 |
| | | | $PM/PM_{10}$ | Emissions Limit | • 0.6 lb/hr (365-day) | • STX-557A-E-02(III)(E), June 4, 2002 |
| | | | VOC | Emissions Limit | • 0.005 lb/mmBtu<br>• 1.0 lb/hr (365-day) | • HOVENSA CD Appendix H<br>• STX-557A-E-02(III)(D), June 4, 2002 |
| Delayed Coker Unit | TK-8501 (Hot pitch tank) | Fixed roof storage tank (pitch) | VOC | Emissions Limit | • 7.3 TPY | • STX-557A-E-02(IV)(A), June 4, 2002 |
| | | | | Work Practice | • Vapor pressure less than 0.5 psia<br>• Limit on Vp or Design/Control Requirement | • STX-557A-E-02(IV)(B), June 4, 2002<br>• 40 CFR 63 subpart CC, Group 2 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| Coker Complex | Coke handling, storage, & loading system | Coke Drum Drop Operations | PM | Work Practice & Emissions Limit | • All coke drum drop operations shall maintain a material moisture content of ≥ 4.8% (annual)<br>• 900 lb/yr | • STX-557A-E-02(VI)(A), June 4, 2002<br>• STX-557A-E-02(VI)(A), June 4, 2002 |
| | | | $PM_{10}$ | Work Practice & Emissions Limit | • All coke drum drop operations shall maintain a material moisture content of ≥ 4.8% (annual)<br>• 300 lb/yr | • STX-557A-E-02(VI)(A), June 4, 2002<br>• STX-557A-E-02(VI)(A), June 4, 2002 |
| | | Coke Drop Operations to the Ship | PM | Work Practice & Emissions Limit | • All coke drum drop operations shall maintain a material moisture content of ≥ 4.8% (annual)<br>• 900 lb/yr | • STX-557A-E-02(VI)(C), June 4, 2002<br>• STX-557A-E-02(VI)(C), June 4, 2002 |
| | | | $PM_{10}$ | Work Practice & Emissions Limit | • All coke drum drop operations shall maintain a material moisture content of ≥ 4.8% (annual)<br>• 300 lb/yr | • STX-557A-E-02(VI)(C), June 4, 2002<br>• STX-557A-E-02(VI)(C), June 4, 2002 |
| | | Coke Storage Dome Vents | PM | Emissions Limit | • 90 lb/hr | • STX-557A-E-02(VI)(D), June 4, 2002 |
| | | | $PM_{10}$ | Emissions Limit | • 30 lb/hr | • STX-557A-E-02(VI)(D), June 4, 2002 |
| | | Coke Crusher | PM | Work Practice & Emissions Limit | • All coke drum drop operations shall maintain a material moisture content of ≥ 4.8% (annual)<br>• 9450 lb/yr | • STX-557A-E-02(VI)(E), June 4, 2002<br>• STX-557A-E-02(VI)(E), June 4, 2002 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| | | | $PM_{10}$ | Work Practice & Emissions Limit | • All coke drum drop operations shall maintain a material moisture content of ≥ 4.8% (annual)<br>• 4500 lb/yr | • STX-557A-E-02(VI)(E), June 4, 2002<br>• STX-557A-E-02(VI)(E), June 4, 2002 |
| Coker Complex | Tank TK-8511 and Residuals Recycling System | Tank TK-8511 and recycling system | VOC | Design & Work Practice | • Granulated activated carbon (GAC)control to achieve 96% control<br>• Storage of slurry for injection into Coker.<br>• GAC shall be three canisters in series<br>• Daily monitoring of GAC to determine breakthrough between first and second canister<br>• Limit on Vp or Design/Control Requirement | • STX-557A-E-02(IV)(F), June 4, 2002<br>• STX-557A-E-02(IV)(I), June 4, 2002<br>• STX-557A-E-02(IV)(G&H), June 4, 2002<br>• STX-557A-E-02(IV)(G&H), June 4, 2002<br>• 40 CFR 63 subpart CC, Group 2 |
| Coker Complex | Delayed Coker Steam Vent | Delayed Coker Steam Vent | All | Work Practice | • Prior to venting comply average vessel pressure of 2 psig determined on a rolling 60-event average | • HOVENSA CD ¶132 |
| Utilities (Powerhouse and Boilers) | Utilities (Powerhouse and Boilers) | Process Fugitives | VOC | Work Practice | Work Practice Requirements | • HOVENSA CD ¶¶ 101 & 109<br>40 CFR 63 subpart A & CC |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| Utility II | #5 Boiler (B-1155) | Boiler; Produces Steam | $SO_2$ | Emissions Limit | • Oil max S content 0.55 wt% (anytime), 0.5 wt% (365-day) and 0.3 wt% (scenario dependent)<br>• Oil max S content 0.5 wt% or 1.0 wt% (scenario dependent)<br>• 249,660 or 194,472 bbl/yr (scenario dependent)<br>• B-1151, B-1153, B-1154, & B-1155 max oil 355,437 or 742,739 bbl/yr (scenario dependent)<br>• 0.80 lb/MMBtu<br>• Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day) | • HOVENSA CD ¶¶37 & 38<br>• 2011 FCCU PSD Permit (III)(C)(c), (d), & (e)<br>• 2011 FCCU PSD Permit (III)(C)(d) & (e)<br>• 2011 FCCU PSD Permit (III)(C)(d) & (e)<br>• 40 CFR 60 subpart A & D<br>• 40 CFR 60 subparts A & D<br>• HOVENSA CD ¶34<br>• HOVENSA CD ¶34 |
| | | | $NO_X$ | Emissions Limit | • 0.30 lb/MMBtu (oil)<br>• 0.20 lb/MMBtu (gas) | • 40 CFR 60 subpart A & D<br>• 40 CFR 60 subpart A & D |
| | | | PM | Emissions Limit | • 0.26 lb/mmBtu<br>• 0.10 lb/MMBtu | • VIRR 12-09-204-23(b)(4)<br>• 40 CFR 60 subpart A & D |
| Utility III | #6 Boiler (B-3301) | Boiler; Produces Steam | $SO_2$ | Emissions Limit | • Oil max S content 0.55 wt% (anytime), 0.5 wt% (365-day) and 0.3 wt% (scenario dependent)<br>• Oil max S content 0.5 wt% or 1.0 wt% (scenario dependent)<br>• B-3301, B-3302, B-3303, & B-3304 max oil 494,721 or 1,092,263 bbl/yr (scenario dependent)<br>• B-3301 & B-3302 max oil 262,800 or 373,833 bbl/yr (scenario dependent)<br>• Fuel gas $H_2S$ 162 ppmv (3-hr) | • HOVENSA CD ¶¶37 & 38<br>• 2011 FCCU PSD Permit (III)(C)(c), (d), & (e)<br>• 2011 FCCU PSD Permit (III)(C)(d) & (e)<br>• 2011 FCCU PSD Permit (III)(C)(d) and (e)<br>• HOVENSA CD ¶34 |
| | | | PM | Emissions Limit | 0.3 lb/mmBtu | • VIRR 12-09-204-23(b)(2) & (4) |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| Utility III | #7 Boiler (B-3302) | Boiler; Produces Steam | $SO_2$ | Emissions Limit | • Oil max S content 0.55 wt% (anytime), 0.5 wt% (365-day) and 0.3 wt% (scenario dependent)<br>• Oil max S content 0.5 wt% or 1.0 wt% (scenario dependent)<br>• B-3301, B-3302, B-3303, & B-3304 max oil 494,721 or 1,092,263 bbl/yr (scenario dependent)<br>• B-3301 & B-3302 max oil 262,800 or 373,833 bbl/yr (scenario dependent)<br>• Fuel gas $H_2S$ 162 ppmv (3-hr) | • HOVENSA CD ¶¶37 & 38<br>• 2011 FCCU PSD Permit (III)(C)(c), (d), & (e)<br>• 2011 FCCU PSD Permit (III)(C)(d) & (e)<br>• 2011 FCCU PSD Permit (III)(C)(d) & (e)<br>• 40 CFR 60 subpart A and J |
| | | | PM | Emissions Limit | 0.3 lb/mmBtu | • VIRR 12-09-204-23(b)(2) & (4) |
| Utility III | #8 Boiler (B-3303) | Boiler; Produces Steam | $SO_2$ | Emissions Limit | • Oil max S content 0.55 wt% (anytime), 0.5 wt% (365-day) and 0.3 wt% (scenario dependent)<br>• Oil max S content 0.5 wt% or 1.0 wt% (scenario dependent)<br>• B-3301, B-3302, B-3303, & B-3304 max oil 494,721 or 1,092,263 bbl/yr (scenario dependent)<br>• 0.80 lb/MMBtu<br>• Fuel gas $H_2S$ 162 ppmv (3-hr) | • HOVENSA CD ¶¶37 & 38<br>• 2011 FCCU PSD Permit (III)(C)(c), (d), & (e)<br>• 2011 FCCU PSD Permit (III)(C)(d) & (e)<br>• 40 CFR 60 subpart A & D<br>• HOVENSA CD ¶34 |
| | | | $NO_X$ | Emissions Limit | • 0.30 lb/MMBtu (oil)<br>• 0.20 lb/MMBtu (gas) | • 40 CFR 60 subpart A & D<br>• 40 CFR 60 subpart A & D |
| | | | PM | Emissions Limit | • 0.26 lb/mmBtu<br>• 0.10 lb/MMBtu | • VIRR 12-09-204-23(b)(2) & (4)<br>• 40 CFR 60 subpart A & D |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| Utility III | #9 Boiler (B-3304) | Boiler; Produces Steam | $SO_2$ | Emissions Limit | • Oil max S content 0.55 wt% (anytime), 0.5 wt% (365-day) and 0.3 wt% (scenario dependent)<br>• Oil max S content 0.5 wt% or 1.0 wt% (scenario dependent)<br>• B-3301, B-3302, B-3303, & B-3304 max oil 494,721 or 1,092,263 bbl/yr (scenario dependent)<br>• 0.80 lb/MMBtu<br>• Fuel gas $H_2S$ 162 ppmv (3-hr) | • HOVENSA CD ¶¶37 & 38<br>• 2011 FCCU PSD Permit (III)(C)(c), (d), & (e)<br>• 2011 FCCU PSD Permit (III)(C)(d) & (e)<br>• 40 CFR 60 subpart A & D<br>• HOVENSA CD ¶34 |
| | | | $NO_X$ | Emissions Limit | • 0.30 lb/MMBtu (oil)<br>• 0.20 lb/MMBtu (gas) | • 40 CFR 60 subpart A & D<br>• 40 CFR 60 subpart A & D |
| | | | PM | Emissions Limit | • 0.26 lb/mmBtu<br>• 0.10 lb/MMBtu | • VIRR 12-09-204-23(b)(2) & (4)<br>• 40 CFR 60 subpart A & D |
| Utility III | #10 Boiler (B-3701) | Boiler; Produces Steam | $SO_2$ | Emissions Limit | • Oil max S content 0.55 wt% (anytime), 0.5 wt% (365-day) and 0.3 wt% (scenario dependent)<br>• Fuel gas $H_2S$ 75 ppmv (3-hr)<br>• 2.6 lb/hr (365-day) | • HOVENSA CD ¶¶ 37 & 38<br>• STX-557-I-00 (II)(E), September 18, 2000<br>• STX-557-I-00 (II)(E), September 18, 2000 |
| | | | $NO_X$ | Emissions Limit | • 0.07 lb/mmBtu<br>• 15.8 lb/hr<br>• 0.2 lb/mmBtu (30-day) | • STX-557-I-00 (II)(F), September 18, 2000<br>• STX-557-I-00 (II)(F), September 18, 2000<br>• 40 CFR 60 subpart A & Db |
| | | | CO | Emissions Limit | • 0.07 lb/mmBtu<br>• 15.8 lb/hr | • HOVENSA CD Appendix H<br>• STX-557-I-00 (II)(G), September 18, 2000 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| | | | $PM/PM_{10}$ | Emissions Limit | • 0.7 lb/hr | • STX-557-I-00 (II)(I), September 18, 2000 |
| | | | VOC | Emissions Limit | • 0.005 lb/mmBtu<br>• 1.1 lb/hr | • HOVENSA CD Appendix H<br>• STX-557-I-00 (II)(H), September 18, 2000 |
| Powerhouse 2 | GT No. 4 (G-3404) | Turbine; Produces Electricity | $SO_2$ | Emissions Limit | • Oil max S content 0.2 wt%<br>• G-1101E, G-1101F, G-1101G, G-3404, G-3405, G-3406, G-3407, G-3408, G-3409, G-3410 max oil 1,576,800 or 1,782,770 bbl/yr (scenario dependent)<br>• G-3404, G-3405, G-3406, G-3407, G-3408, G-3409, and G-3410 max oil 1,314,000 or 1,277,208 bb;/yr (scenario dependent)<br>• Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Oil max S content 0.8 wt% | • 2011 FCCU PSD Permit (III)(D)(c) & (d)<br>• 2011 FCCU PSD Permit (III)(D)(c) & (d)<br>• 2011 FCCU PSD Permit (III)(D)(c) & (d)<br>• HOVENSA CD ¶34<br>• 40 CFR 60 subpart A & GG |
| | | | $NO_X$ | Emissions Limit | • Gas: 160 ppmvd @ 15% $O_2$<br>• Oil: 152 ppmvd @ 15% $O_2$ | • 40 CFR 60 subpart A & GG<br>• 40 CFR 60 subpart A & GG |
| | | | PM | Emissions Limit | • 0.29 lb/mmBtu | • VIRR 12-09-204-23(b)(2) & (4) |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| Powerhouse 2 | GT No. 5 (G-3405) | Turbine; Produces Electricity | $SO_2$ | Emissions Limit | • Oil max S content 0.2 wt%<br>• G-1101E, G-1101F, G-1101G, G-3404, G-3405, G-3406, G-3407, G-3408, G-3409, G-3410 max oil 1,576,800 or 1,782,770 bbl/yr (scenario dependent)<br>• G-3404, G-3405, G-3406, G-3407, G-3408, G-3409, and G-3410 max oil 1,314,000 or 1,277,208 bb;/yr (scenario dependent)<br>• Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day)<br>• Oil max S content 0.8 wt% | • 2011 FCCU PSD Permit (III)(D)(c) & (d)<br>• 2011 FCCU PSD Permit (III)(D)(c) & (d)<br>• 2011 FCCU PSD Permit (III)(D)(c) & (d)<br>• HOVENSA CD ¶34<br>• HOVENSA CD ¶34<br>• 40 CFR 60 subpart A & GG |
| | | | $NO_X$ | Emissions Limit | • Gas: 160 ppmvd @ 15% $O_2$<br>• Oil: 152 ppmvd @ 15% $O_2$ | • 40 CFR 60 subpart A & GG<br>• 40 CFR 60 subpart A & GG |
| | | | PM | Emissions Limit | • 0.29 lb/mmBtu | • VIRR 12-09-204-23(b)(2) & (4) |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| Powerhouse 2 | GT No. 7 (G-3407) | Turbine; Produces Electricity | $SO_2$ | Emissions Limit | • Oil max S content 0.2 wt%<br>• Oil max S content 0.1 wt%<br>• G-1101E, G-1101F, G-1101G, G-3404, G-3405, G-3406, G-3407, G-3408, G-3409, G-3410 max oil 1,576,800 or 1,782,770 bbl/yr (scenario dependent)<br>• G-3404, G-3405, G-3406, G-3407, G-3408, G-3409, and G-3410 max oil 1,314,000 or 1,277,208 bb;/yr (scenario dependent)<br>• Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day)<br>• Oil max S content 0.8 wt% | • 2011 FCCU PSD Permit (III)(D)(c) & (d)<br>• STX-895-AC-PO-18-2 Marine Loading Permit<br>• 2011 FCCU PSD Permit (III)(D)(c) & (d)<br>• 2011 FCCU PSD Permit (III)(D)(c) & (d)<br>• HOVENSA CD ¶34<br>• HOVENSA CD ¶34<br>• 40 CFR 60 subpart A & GG |
| | | | $NO_X$ | Emissions Limit | • Gas: 160 ppmvd @ 15% $O_2$<br>• Oil: 150 ppmvd @ 15% $O_2$ | • 40 CFR 60 subpart A & GG<br>• 40 CFR 60 subpart A & GG |
| | | | PM | Emissions Limit | • 0.29 lb/mmBtu | • VIRR 12-09-204-23(b)(2) & (4) |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| Powerhouse 2 | GT No. 8 (G-3408) | Turbine; Produces Electricity | $SO_2$ | Emissions Limit | • Oil max S content 0.2 wt%<br>• Oil max S content 0.1 wt%<br>• G-1101E, G-1101F, G-1101G, G-3404, G-3405, G-3406, G-3407, G-3408, G-3409, G-3410 max oil 1,782,770 bbl/yr<br>• G-3404, G-3405, G-3406, G-3407, G-3408, G-3409, and G-3410 max oil 1,314,000 or 1,277,208 bb;/yr (scenario dependent)<br>• Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day)<br>• Oil max S content 0.8 wt% | • 2011 FCCU PSD Permit (III)(D)(c) & (d)<br>• STX-895-AC-PO-18-2 Marine Loading Permit<br>• 2011 FCCU PSD Permit (III)(D)(c) & (d)<br>• 2011 FCCU PSD Permit (III)(D)(c) & (d)<br>• HOVENSA CD ¶34<br>• HOVENSA CD ¶34<br>• 40 CFR 60 subpart A & GG |
| | | | $NO_X$ | Emissions Limit | • Gas: 166 ppmvd @ 15% $O_2$<br>• Oil: 165 ppmvd @ 15% $O_2$ | • 40 CFR 60 subpart A & GG<br>• 40 CFR 60 subpart A & GG |
| | | | PM | Emissions Limit | • 0.27 lb/mmBtu | • VIRR 12-09-204-23(b)(2) & (4) |
| Powerhouse 2 | GT No. 9 (G-3409) | Turbine; Produces Electricity | All | Operating Limit | • 304 mmBtu/hr (annual) | • STX-557-J-K-05(C)(2), November 22, 2005 |
| | | | All | Operating Limit | • Load > 50% except during periods of startup and shutdown<br>• Startup is defined as establishing 11 MW<br>• Startup and shutdown shall not exceed a duration of 1-hr | • STX-557-J-K-05(B)(2), November 22, 2005<br>• STX-557-J-K-05(C)(1), November 22, 2005<br>• STX-557-J-K-05(C)(1), November 22, 2005 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| | | | $SO_2$ | Emissions Limit | • Oil max S content 0.2 wt%<br>• Oil max S content 0.1 wt%<br>• G-1101E, G-1101F, G-1101G, G-3404, G-3405, G-3406, G-3407, G-3408, G-3409, G-3410 max oil 1,576,800 or 1,782,770 bbl/yr (scenario dependent)<br>• G-3404, G-3405, G-3406, G-3407, G-3408, G-3409, and G-3410 max oil 1,314,000 or 1,277,208 bb;/yr (scenario dependent)<br>• Max oil 266,304 mmBtu/yr<br>• Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day)<br>• Oil max S content 0.8 wt% | • 2011 FCCU PSD Permit (III)(D)(c) & (d)<br>• STX-895-AC-PO-18-2 Marine Loading Permit<br>• 2011 FCCU PSD Permit (III)(D)(c) & (d)<br>• 2011 FCCU PSD Permit (III)(D)(c) & (d)<br>• STX-557-J-K-05(A)(2), November 22, 2005<br>• HOVENSA CD ¶34<br>• HOVENSA CD ¶34<br>• 40 CFR 60 subpart A & GG |
| | | | $NO_X$ | Emissions Limit | • Gas: 0.015(14.4/Y +F)<br>• Oil: 0.15(14.4/Y) + F<br>• 42 ppmvd @ 15% $O_2$<br>• 57.0 lb/hr<br>• 150.2 TPY | • 40 CFR 60 subpart A & GG<br>• 40 CFR 60 subpart A & GG<br>• STX-557-J-K-05(B)(1), November 22, 2005<br>• STX-557-J-K-05(B)(1), November 22, 2005<br>• STX-557-J-K-05(B)(1), November 22, 2005 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| | | | CO | Emissions Limit | • Gas: 206.5 ppmvd @15% $O_2$<br>• Gas: 94.0 lb/hr (Block hour)<br>• Oil: 242 ppmvd @15% $O_2$<br>• Oil: 111 lb/hr (Block hour)<br>• Gas & Oil: 44.1 TPY (365-day) | • [STX-557-J-K-05(B)(2), November 22, 2005<br>• [STX-557-J-K-05(B)(2), November 22, 2005<br>• [STX-557-J-K-05(B)(2), November 22, 2005<br>• [STX-557-J-K-05(B)(2), November 22, 2005<br>• [STX-557-J-K-05(B)(2), November 22, 2005 |
| | | | PM | Emissions Limit | • 0.27 lb/mmBtu | • VIRR 12-09-204-23(b)(2) & (4) |
| | | | $PM_{10}$ | Emissions Limit | • Gas: 2.5 lb/hr<br>• Oil: 9.5 lb/hr | • STX-557-J-K-05(B)(3), November 22, 2005<br>• STX-557-J-K-05(B)(3), November 22, 2005 |
| Powerhouse 2 | GT No. 10 (G-3410) | Turbine; Produces Electricity | All | Emissions Limit | • 325 mmBtu/hr | • GT-10 PSD Permit (XII)(1) |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| | | | $SO_2$ | Emissions Limit | • Oil max S content 0.2 wt%<br>• G-1101E, G-1101F, G-1101G, G-3404, G-3405, G-3406, G-3407, G-3408, G-3409, G-3410 max oil 1,576,800 or 1,782,770 bbl/yr (scenario dependent)<br>• G-3404, G-3405, G-3406, G-3407, G-3408, G-3409, and G-3410 max oil 1,314,000 or 1,277,208 bb;/yr (scenario dependent)<br>• Max oil 266,304 mmBtu/yr<br>• Oil: 876 hr/yr (365-day)<br>• Fuel gas $H_2S$ 162 ppmv (3-hr)<br>• Fuel gas $H_2S$ 60 ppmv (365-day)<br>• Oil max S content 0.8 wt% | • GT-10 PSD Permit (VII)(1)<br>• 2011 FCCU PSD Permit (III)(D)(c) & (d)<br>• 2011 FCCU PSD Permit (III)(D)(c) & (d)<br>• STX-557-J-K-05(A)(2), November 22, 2005<br>• GT-10 PSD Permit (VII)(2)<br>• HOVENSA CD ¶34<br>• HOVENSA CD ¶34<br>• 40 CFR 60 subpart A & GG |
| | | | $NO_X$ | Emissions Limit<br><br><br><br><br>Operating Limit | • Gas: 0.015(14.4/Y +F)<br>• Oil: 0.15(14.4/Y) + F<br>• 42 ppmvd @ 15% $O_2$<br>• 57.0 lb/hr<br>• 150.2 TPY<br>• Load > 50% except during periods of startup and shutdown | • 40 CFR 60 subpart A & GG<br>• 40 CFR 60 subpart A & GG<br>• GT-10 PSD Permit (VII)(1)<br>• GT-10 PSD Permit (VII)(1)<br>• GT-10 PSD Permit (VII)(1)<br>• GT-10 PSD Permit (XII)(1) |
| | | | CO | Emissions Limit | • Gas: 206.5 ppmvd @15% $O_2$<br>• Gas: 94.0 lb/hr (Block hour)<br>• Oil: 242 ppmvd @15% $O_2$<br>• Oil: 111 lb/hr (Block hour)<br>• 44.1 TPY (365-day) | • GT-10 PSD Permit (VIII)(2)<br>• GT-10 PSD Permit (VIII)(2)<br>• GT-10 PSD Permit (VIII)(2)<br>• GT-10 PSD Permit (VIII)(2)<br>• GT-10 PSD Permit (VIII)(2) |
| | | | PM | Emissions Limit | • 0.10 lb/mmBtu | • VIRR 12-09-204-23(b)(2) & (4) |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| | | | $PM_{10}$ | Emissions Limit | • Gas: 2.5 lb/hr<br>• Oil: 9.5 lb/hr | • GT-10 PSD Permit V(III)(3) & (X)(7)<br>• GT-10 PSD Permit V(III)(3) & (X)(7) |
| GT No. 13 and Duct Burner | GT No. 13 (G-3413 & H-3413) | Turbine; Produces Electricity | All | Emissions Limit | • 356 mmBtu/hr | • LSFP PSD Permit VI.A.1 |
| | | | All | Operating Limit | • Load > 60% except during periods of startup and shutdown<br>• Startup shall not exceed: 4-hr for cold startups, 2-hr for warm startup and 1.5-hr for hot startup.<br>• Shutdown shall not exceed a duration of 1-hr | • LSFP PSD Permit VI.A.5.c<br>• PSD Permit VI.A.5.c<br>• LSFP PSD Permit VI.A.5.c |
| | | | All | Operating Limit | • Max. hours the HRSG can be bypassed shall not exceed 720 hr/yr | • LSFP PSD Permit VI.A.4 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| | | | $SO_2$ | Emissions Limit | Gas w/DB:<br>● Fuel gas $H_2S$ 162 ppmv (3-hr)<br>● Fuel gas $H_2S$ 75 ppmv (24-hr)<br>Gas w/o DB:<br>● Oil max S 0.05 wt%<br>● Max oil 74,947 bbl (12-mth)<br>Gas w/DB:<br>● 0.024 lb/mmBtu (3-hr)<br>● 15.0 lb/hr (3-hr)<br>● 0.011 lb/mmBtu (24-hr)<br>● 6.9 lb/hr (24-hr)<br>Gas w/o DB:<br>● 0.024 lb/mmBtu (3-hr)<br>● 8.5 lb/hr (3-hr)<br>● 0.011 lb/mmBtu (24-hr)<br>● 3.9 lb/hr (24-hr)<br>Oil w/DB:<br>● 0.041 lb/mmBtu (3-hr)<br>● 25.4 lb/hr (3-hr)<br>● 0.035 lb/mmBtu (24-hr)<br>● 21.9 lb/hr (24-hr)<br>Oil w/o DB:<br>● 0.53 lb/mmBtu (3-hr)<br>● 18.9 lb/hr (3-hr) | ● LSFP PSD Permit VII.A.3 & 40 CFR 60 subpart A and J<br>● LSFP PSD Permit VII.A.3<br>● LSFP PSD Permit VII.A.4<br>● LSFP PSD Permit VII.A.5<br>● LSFP PSD Permit VIII.A.4.c&d<br>● LSFP PSD Permit VIII.A.4.c&d<br>● LSFP PSD Permit VIII.A.4.c&d<br>● LSFP PSD Permit VIII.A.4.c&d<br>● LSFP PSD Permit VIII.A.4.c&d<br>● LSFP PSD Permit VIII.A.4.c&d<br>● LSFP PSD Permit VIII.A.4.c&d<br>● LSFP PSD Permit VIII.A.4.c&d<br>● LSFP PSD Permit VIII.A.4.c&d<br>● LSFP PSD Permit VIII.A.4.c&d<br>● LSFP PSD Permit VIII.A.4.c&d<br>● LSFP PSD Permit VIII.A.4.c&d<br>● LSFP PSD Permit VIII.A.4.c&d<br>● LSFP PSD Permit VIII.A.4.c&d |
| | | | $NO_X$ | Emissions Limit | ● Gas: 13 ppmvd @ 15% $O_2$ & 0.0497 lb/mmBtu<br>● Oil: 20 ppmvd @ 15% $O_2$ & 0.0761 lb/mmBtu<br>● During periods when the HRSG is bypassed 42 ppmvd @ 15% O2 and 0.16 lb/mmBtu | ● LSFP PSD Permit VIII.A.5.a&b<br>● LSFP PSD Permit VIII.A.5.a&b<br>● LSFP PSD Permit VIII.A.5.d |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| | | | CO | Emissions Limit | • 196 TPY (365-day) | • LSFP PSD Permit VIII.A.7 |
| | | | PM | Emissions Limit | • 0.1 lb/mmBtu<br>Gas w/DB:<br>• 0.033 lb/mmBtu<br>• 20.5 lb/hr<br>Gas w/o DB:<br>• 0.0096 lb/mmBtu<br>• 3.4 lb/hr<br>Oil w/DB:<br>• 0.053 lb/mmBtu<br>• 33 lb/hr<br>Oil w/o DB:<br>• 0.021 lb/mmBtu<br>• 7.5 lb/hr | • VIRR 12-09-204-23(b)(2)<br><br>• LSFP PSD Permit VIII.A.1.a-d<br>• LSFP PSD Permit VIII.A.1.a-d<br><br>• LSFP PSD Permit VIII.A.1.a-d<br>• LSFP PSD Permit VIII.A.1.a-d<br><br>• LSFP PSD Permit VIII.A.1.a-d<br>• LSFP PSD Permit VIII.A.1.a-d<br><br>• LSFP PSD Permit VIII.A.1.a-d<br>• LSFP PSD Permit VIII.A.1.a-d |
| | | | $PM_{10}$ | Emissions Limit | Gas w/DB:<br>• 0.037 lb/mmBtu<br>• 22.9 lb/hr<br>Gas w/o DB:<br>• 0.016 lb/mmBtu<br>• 5.8 lb/hr<br>Oil w/DB:<br>• 0.066 lb/mmBtu<br>• 41.0 lb/hr<br>Oil w/o DB:<br>• 0.043 lb/mmBtu<br>• 15.4 lb/hr | <br>• LSFP PSD Permit VIII.A.2.a-d<br>• LSFP PSD Permit VIII.A.2.a-d<br><br>• LSFP PSD Permit VIII.A.2.a-d<br>• LSFP PSD Permit VIII.A.2.a-d<br><br>• LSFP PSD Permit VIII.A.2.a-d<br>• LSFP PSD Permit VIII.A.2.a-d<br><br>• LSFP PSD Permit VIII.A.2.a-d<br>• LSFP PSD Permit VIII.A.2.a-d |
| | | Duct Burner Produced Steam | All | Emissions Limit | • 270.1 mmBtu/hr | • LSFP PSD Permit VI.A.3 |
| Tank | TK-01PR | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| Tank | TK-02PR | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-03PR | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-04PR | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-05PR | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-06PR | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-07PR | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-0702 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-1066 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-1071 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-1118 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-1151 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-1156 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-1157 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-1201 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-1202 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-1203 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| Tank | TK-1204 | Horizontal Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-1205 | Horizontal Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-1206 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-1207 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-1208 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-1236 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-1301 | Horizontal Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-1302 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-1304 | Horizontal Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-1305 | Horizontal Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-1401 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-1600 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-1621 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-1622 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-1626 | Horizontal Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-1627 | Horizontal Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| Tank | TK-1628 | Horizontal Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-1629 | Horizontal Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-1630 | Horizontal Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-1631 | Horizontal Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-1632 | Horizontal Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-1633 | Horizontal Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-1653 | Horizontal Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-1663 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-2653 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-2654 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-3201 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-3202 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-3203 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-3204 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-3205 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-3208 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| Tank | TK-3209 | Horizontal Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-3301 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-3302 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-3304 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-3305 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-3306 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-3384 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-3385 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-3386 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-4501 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-4502 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-4503 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-6801 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-6802 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-6803 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-6804 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| Tank | TK-6805 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-6806 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-6807 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-6808 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-6809 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-6810 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6811 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6812 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6813 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6814 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-6815 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-6816 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-6817 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6818 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6819 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6820 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| Tank | TK-6821 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6822 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6823 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6824 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6825 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6831 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-6832 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-6833 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-6834 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-6835 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-6836 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-6837 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-6838 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-6839 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-6840 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-6841 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| Tank | TK-6842 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-6843 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-6851 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6852 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6853 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6854 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6858 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6859 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6860 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6871 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6872 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6873 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6874 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6875 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6876 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6877 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| Tank | TK-6880 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6881 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6883 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6884 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-6887 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-6888 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7051 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7201 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7206 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7207 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7208 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7209 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7210 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7211 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7301 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7302 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| Tank | TK-7401 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7402 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7403 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7404 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7405 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7406 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7407 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7408 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7409 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7410 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7411 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7412 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7413 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7414 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7415 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7416 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| Tank | TK-7417 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7418 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7421 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7422 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7423 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7424 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7425 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7426 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7427 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7428 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7429 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7430 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7431 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7432 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7433 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7434 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| Tank | TK-7435 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7436 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7437 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7438 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7439 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7440 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7441 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7443 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7444 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7445 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7446 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7447 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7448 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7449 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7451 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7452 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| Tank | TK-7453 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7454 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7455 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7456 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7501 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7502 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7503 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7504 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7505 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7506 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7507 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7508 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7509 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7510 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7511 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7512 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| Tank | TK-7513 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7514 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7515 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7516 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7517 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7521 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7522 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7523 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7524 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7525 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7526 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7528 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7541 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7542 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7571 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7601 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| Tank | TK-7602 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7603 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7604 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7605 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7933 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7934 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7943 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7956 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-7966 | Fixed Roof Tank (with Carbon Canisters) | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7973 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7974 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-S-7974 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7975 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-S-7975 | External Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-7976 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| Tank | TK-7986 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-8001 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-8002 | Internal Floating Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-8501 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TK-8503 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-8505 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-8508 | Horizontal Tank | | | • | • |
| Tank | TK-8511 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-8701 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | UTT1 | Fixed Roof Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 2 |
| Tank | TK-D290 (frmly D1301) | Horizontal Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TKD-1609 | Horizontal Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Tank | TKD-1610 | Horizontal Tank | VOC | Work Practice | • Limit on Vp or Design/Control Requirement | • 40 CFR 63 subpart CC, Group 1 |
| Seawater & Desal Water Pumps | PD-1602 | Seawater intake pump Reciprocating engine driver | $SO_2$ | Emissions Limit | • Max S content 0.2 wt% | • 2011 FCCU PSD Permit (III)(D)(e) |
| | | | PM | Emissions Limit | • 0.86 lb/mmBtu | • VIRR 12-09-204-23(b)(4) |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| Seawater & Desal Water Pumps | PD-1603 | Seawater intake pump Reciprocating engine driver | $SO_2$ | Emissions Limit | • Max S content 0.2 wt% | • 2011 FCCU PSD Permit (III)(D)(e) |
| | | | PM | Emissions Limit | • 0.86 lb/mmBtu | • VIRR 12-09-204-23(b)(4) |
| Seawater & Desal Water Pumps | PD-1604 | Seawater intake pump Reciprocating engine driver | $SO_2$ | Emissions Limit | • Max S content 0.2 wt% | • 2011 FCCU PSD Permit (III)(D)(e) |
| | | | PM | Emissions Limit | • 0.86 lb/mmBtu | • VIRR 12-09-204-23(b)(4) |
| Seawater & Desal Water Pumps | PD-1605 | Seawater intake pump Reciprocating engine driver | $SO_2$ | Emissions Limit | • Max S content 0.2 wt% | • 2011 FCCU PSD Permit (III)(D)(e) |
| | | | PM | Emissions Limit | • 0.86 lb/mmBtu | • VIRR 12-09-204-23(b)(4) |
| Seawater & Desal Water Pumps | PD-1620 | Seawater intake pump Reciprocating engine driver | $SO_2$ | Emissions Limit | • Max S content 0.2 wt% | • 2011 FCCU PSD Permit (III)(D)(e) |
| | | | PM | Emissions Limit | • 0.94 lb/mmBtu | • VIRR 12-09-204-23(b)(4) |
| Marine Loading | Unit No. 1600 | Ship loading and unloading | All | Operating Limit | • Marine loading from Terminal Storage operations shall be limited to on a rolling monthly basis to:<br>- 127.1 mmbbl/yr crude oils<br>- 79.0 mmbbl/yr gasoline/gasoline blendstocks<br>• - 168.7 mmbbl/yr of other commodities | • STX-895-AC-PO-18-2 Marine Loading Permit III.B.3(a)(i) through (iii) |
| | | | VOC | Emissions Limit | • 2000 TPY (12-month) | • STX-895-AC-PO-18-2 Marine Loading Permit III.B.1(a) |

| Process Unit | Source ID | Unit Description | PAL Pollutant | Applicable Requirement Type | Applicable Requirement | Applicable Requirement Authority [1,2] |
|---|---|---|---|---|---|---|
| | | | NOx | Emissions Limit | • H-1612: 0.02 lb/mmBtu<br>• H-1612: 1.5 TPY | • STX-895-AC-PO-18-2 Marine Loading Permit III.B.2.(c)i<br>• STX-895-AC-PO-18-2 Marine Loading Permit III.C.1 |
| | | | CO | Emissions Limit | • H-1612: 0.02 lb/mmBtu<br>• H1612: 2.0 TPY | • STX-895-AC-PO-18-2 Marine Loading Permit III.B.2.(c)ii |
| | | | $SO_2$ | Emissions Limit | • H-1612: < 1.0 TPY | • STX-895-AC-PO-18-2 Marine Loading Permit III.C.1 |
| | | | $PM_{10}$ | Emissions Limit | • H-1612: < 1.0 TPY | • STX-895-AC-PO-18-2 Marine Loading Permit III.C.1 |
| | | | $PM_{2.5}$ | Emissions Limit | • H-1612: < 1.0 TPY | • STX-895-AC-PO-18-2 Marine Loading Permit III.C.1 |
| Truck loading rack | Unit No. 1651 | Dispense liquid & gaseous fuel to tank trucks | VOC | Emissions Limit & Design | • 35 mg Total Organic Compounds/L loaded<br>• Submerged fill and vapors directed to vapor recovery unit<br>• 10 mg Total Organic Compounds/L loaded | • STX-557-H-00(III)(C), September 18, 2000<br>• Truck Loading Facility Permit No. 414-96(h), July 25, 1996<br>• 40 CFR 63 subparts A and CC |

[1] References to HOVENSA CD with a paragraph (¶) number cited are to the location within the consent decree (CD) between the United States, HOVENSA, LLC and the U.S.V.I.

[2] The applicable requirement authority references to 2011 FCCU PSD Permit are to what is referred to as the 2009 PSD Permit in the 2010 Title V operating permit. This permit was updated as part of a project at the sulfuric acid plant in 2011.

# 4.0 CALCULATION OF BASELINE ACTUAL EMISSIONS

In accordance with 40 CFR 52.21(aa)(3)(ii), this section of the permit application summarizes the calculations performed by Limetree Bay Terminals and Refining to determine baseline actual emissions ("BAE") and the proposed PAL levels.

## 4.1 BASELINE ACTUAL EMISSIONS

The pertinent parts of the definition of this term, as provided in 40 CFR 52.21(b)(48), are as follows:

> *"Baseline actual emissions" means the rate of emissions, in tons per year, of a regulated NSR pollutant, as determined in accordance with paragraphs (b)(48)(i) through (iv) of this section:*
>
> *
>
> *
>
> *ii. For an existing emissions unit (other than an electric utility steam generating unit), baseline actual emissions means the average rate, in tons per year, at which the emissions unit actually emitted the pollutant during any consecutive 24-month period selected by the owner or operator within the 10-year period immediately preceding either the date the owner or operator begins actual construction of the project, or the date a complete permit application is received by the Administrator for a permit required under this section or by the reviewing authority for a permit required by a plan, whichever is earlier, except that the 10-year period shall not include any period earlier than November 15, 1990.*
>
> > *(a) The average rate shall include fugitive emissions to the extent quantifiable, and emissions associated with startups, shutdowns, and malfunctions.*
> >
> > *(b) The average rate shall be adjusted downward to exclude any non-compliant emissions that occurred while the source was operating above an emission limitation that was legally enforceable during the consecutive 24-month period.*
> >
> > *(c) The average rate shall be adjusted downward to exclude any emissions that would have exceeded an emission limitation with which the major stationary source must currently comply, had such major stationary source been required to comply with such limitations during the consecutive 24-month period. However, if an emission limitation is part of a maximum achievable control technology standard that the Administrator proposed or promulgated under part 63 of this chapter, the baseline actual emissions need only be adjusted if the State has taken credit for such emissions reductions in an attainment demonstration or maintenance plan consistent with the requirements of §51.165(a)(3)(ii)(G) of this chapter.*

*(d) For a regulated NSR pollutant, when a project involves multiple emissions units, only one consecutive 24-month period must be used to determine the baseline actual emissions for all the emissions units being changed. A different consecutive 24-month period can be used for each regulated NSR pollutant.*

*(e) The average rate shall not be based on any consecutive 24-month period for which there is inadequate information for determining annual emissions, in tons per year, and for adjusting this amount if required by paragraphs (b)(48)(ii)(b) and (c) of this section.*

*iii. For a new emissions unit, the baseline actual emissions for purposes of determining the emissions increase that will result from the initial construction and operation of such unit shall equal zero; and thereafter, for all other purposes, shall equal the unit's potential to emit.*

*iv. For a PAL for a stationary source, the baseline actual emissions shall be calculated for existing electric utility steam generating units in accordance with the procedures contained in paragraph (b)(48)(i) of this section, for other existing emissions units in accordance with the procedures contained in paragraph (b)(48)(ii) of this section, and for a new emissions unit in accordance with the procedures contained in paragraph (b)(48)(iii) of this section.*

For purposes of this application, the same consecutive 24-month baseline period was selected as the basis for determining the BAE for each of the proposed PAL pollutants: January 2009 – December 2010.

With two categories of exceptions, the BAE for each of the PAL pollutants, for each of the emissions units identified in Section 2.0, are documented in Appendix B, respectively. The first exception is for permanently shut down emissions units: In accordance with 40 CFR 52.21(aa)(6)(i), the BAE of these units is omitted from (*i.e.*, does not contribute to) the PAL, so those values are not documented in Appendix B. The second exception is for newly constructed units: In accordance with 40 CFR 52.21(aa)(6)(ii), emissions of a PAL pollutant from newly constructed units (*i.e.,* emissions units on which actual construction began after the baseline period for that PAL pollutant) are based on PTE. For these units, the PTE rather than the BAE is documented in Appendix B.

In Appendix B the following specific information is provided for each emissions unit for each PAL pollutant:

Source ID, Source Description, and Unit Status: Source ID and descriptions are as listed in Table 2-2. The Unit Status denotes whether the unit is considered existing, permanently shut down, or newly constructed with respect to the selected baseline period. The units that have been permanently shut down were previously identified in Table 2-2.

BAE (TPY): For existing units, which have not been permanently shut down and which are not considered to be newly constructed, the BAE value is the emissions unit's average annual emissions in TPY for the selected baseline period, including any downward adjustments for non-compliant emissions during the baseline period or for limits with which Limetree Bay Terminals and Refining must currently comply. For units identified as new or newly constructed, the listed value is the emissions unit's PTE in TPY.

BAE Supporting Documentation: A cross-reference to the BAE supporting documentation that is contained in Section 4.3 is provided.

## 4.2 General BAE Calculation and Adjustment Approach

The unadjusted BAE for the proposed PAL pollutants from the facility for the selected 24-month period (January 2009 – December 2010) were determined using best available emissions determination methods. Except for a limited set of emissions unit/PAL pollutant combinations, the emissions determination methods used to determine the BAE are consistent with the methods used for emissions inventory reporting during the selected baseline period.

Methods used to determine the unadjusted BAE rates fall into one of the following categories:

- Continuous Emissions Monitoring System ("CEMS");
- Emission factors based on measured or stack test data;
- Vendor-supplied emission factors;
- AP-42 emission factors; and,
- Engineering Calculations.

Unadjusted BAE values for each emissions unit and for each proposed PAL pollutant were evaluated to determine if downward adjustments were required pursuant to 40 CFR 52.21(b)(48)(ii). The current applicable requirements, emission limitations and work practices documented in Table 3-1 were used to identify any emission limitations that became effective during or after the baseline period ("newly applicable requirements"). Unadjusted BAE from emissions unit/PAL pollutant combinations subject to newly applicable requirements were evaluated against those requirements and any required downward adjustments to BAE were made in accordance with 40 CFR 52.21(b)(48)(ii)(c) under the definition of BAE. Limetree Bay Terminals and Refining determined that the currently applicable requirements are equal to or more stringent than the requirements that existed during the baseline period. Therefore, downward adjustments made with respect to current applicable requirements are assumed to include any non-compliant emissions during the baseline period.

Additional details and supporting documentation for the BAE calculation and any adjustments are provided in Section 4.3 by PAL emissions unit or PAL emissions unit category. There are no new emissions units on which actual construction began after the selected baseline period.

## 4.3 BAE CALCULATION SUPPORTING DOCUMENTATION

The BAE calculation and adjustment supporting documentation is contained in the following sub-sections, organized by the following categories of PAL emissions units:

- Fluid Catalytic Cracking Unit ("FCCU")
- Heaters, Boilers, Gas Turbines, and Reciprocating Engines
- Sulfur Recovery Plants ("SRP")
- Flares
- Tanks
- Delayed Coker Steam Vent
- Platformer Vents
- Acid Plant
- Process Fugitives
- Wastewater Treatment
- Truck Loading Racks and Fuel Pumps
- Marine Loading
- Material Handling
- Road Traffic
- Painting
- Fire Training

As described in Section 4.2, the unadjusted PAL pollutant BAE rates from each emissions unit were evaluated to identify any non-compliant emissions during the baseline period and emissions in excess of newly applicable limits and to make corresponding downward adjustments as required. The procedure for making such downward adjustments to the unadjusted BAE was as follows:

1. Identify newly applicable limits, including the form of the limit (*e.g.*, ppm, MMBtu/hr, lb/MMBtu, lb/hr, or TPY), any exemptions from the limit (*e.g.*, emissions due to startup, shutdown, or malfunction) and averaging time;
2. Compare the unadjusted BAE data against any identified newly applicable limit consistent with the form and averaging time of the limit and applicable time period (in the case of limits that became effective during the baseline period);
3. Adjust downward any emissions that were in excess of newly applicable limits; and,
4. Calculate BAE with all required downward adjustments.

### 4.3.1 FCCU

This section describes the calculations used to determine the PAL pollutant BAE from the FCCU (STK-7051).

**$SO_2$, $NO_X$, and CO**: Per requirements in the Title V operating permit ("TVOP"), $SO_2$, $NO_X$, and CO are monitored by a CEMS. The unadjusted BAE rates for CO, $NO_X$, and $SO_2$ were determined by multiplying the concentration data and the estimated daily average exhaust gas flow rate. The daily average exhaust gas flow rate was determined by using a fresh feed to exhaust gas flow rate correlation derived from available stack test data. Daily and monthly emissions were determined by summing the hourly average emissions. The BAE rate represents the annual average emissions during the selected 24-month baseline period.

As shown in Table 3-1, the FCCU (STK-7051) is subject to the following limits and standards:

> <u>$SO_2$</u>**:** The FCCU (STK-7051) is subject to concentration and mass rate limits. The more stringent limits are the concentration-based limits of 16 ppmvd and 25 ppmvd @ 0% $O_2$ on a 365 and seven (7) day rolling average basis, respectively. The concentration-based limits and the mass-based emissions limits are the result of a PSD permitting action. The mass-based limits are less stringent than the concentration-based limits because the exhaust gas flow rate used to determine the mass-based limits represents the FCCU's maximum exhaust rate. The less stringent 50 ppmvd @ 0% $O_2$ (7-day roll) is the subpart J 40 CFR 60.104 $SO_2$ standards. None of the unadjusted $SO_2$ emissions during the selected baseline period were determined to be non-compliant or in excess of applicable limits; therefore, no adjustments were performed.
>
> <u>$NO_X$</u>**:** The FCCU (STK-7051) is subject to three concentration-based and one mass-based emissions limits. For the same reason as the $SO_2$ limit the most stringent limits are the concentration-based limits (i*.e.*, 20 ppmvd and 40 ppmvd @ 0% $O_2$ on a 365 and seven (7) day rolling average basis, respectively. None of the unadjusted $NO_X$ emissions during the selected baseline period were determined to be non-compliant or in excess of applicable limits; therefore, no adjustments were performed.
>
> <u>CO</u>**:** The FCCU (STK-7051) is subject to NSPS subpart J 40 CFR 60.103 and NESHAP subpart UUU 40 CFR 63.1565 standards for CO emissions, as well as, concentration and mass-based permit limits. Compliance with permitted concentration-based limits was determined to be compliance with subpart UUU in accordance with 40 CFR 63.1565. For the same reason as the $SO_2$ limits, the concentration-based limit was determined to be the most stringent. As a result, hourly CO concentration data were evaluated to determine periods where the measured CO concentration exceeded the more stringent concentration-based CO limit. Non-compliant hourly or annual emissions during the baseline period were identified and downwardly adjusted to the applicable limit.

**$PM/PM_{10}/PM_{2.5}$**: The TVOP requires that the PM and $PM_{10}$ emissions rates be determined through stack testing as a function of the unit's coke burn-off rate. The coke burn-off rate-based PM and $PM_{10}$ rates were multiplied by the coke burn-off rate to determine the hourly PM and $PM_{10}$ mass emissions rates. These rates were then summed to determine the annual PM and $PM_{10}$ emissions rate. To determine a similar coke burn-off rate based $PM_{2.5}$ factor, the portion of filterable PM assumed to be $PM_{2.5}$ was 80%.[5]

When the stack test-based emissions factors are applied to the measure coke burn-off rate during the baseline period the mass emissions rate from the FCCU (STK-7051) were determined to be compliant with the mass-based emission limits. As a result, no downward adjustments were required to meet the applicable standards. Further, no emissions in excess of the facility's hourly and annual maximum permitted rates for $PM/PM_{10}$ pursuant to the current operation permit were identified, therefore, no downward adjustments were made.

**VOC:** The FCCU (STK-7051) is subject to a concentration-based limit but there is no stack testing requirement included in the TVOP or underlying PSD permit. A stack test to determine the VOC concentration was performed in May/June 1998. The results from this stack test were compliant with the concentration-based limit. The 1998 stack test results were used to determine the hourly VOC emissions rate by correcting the measured VOC concentration to the measured oxygen level and applying it the hourly flow rate. Daily and monthly emissions were determined by summing the hourly average emissions. The BAE rate represents the annual average emissions during the selected 24-month baseline period. Because the VOC factor was derived from a stack test that was compliant with the limit no downward adjustments were made.

### 4.3.2 Heaters, Boilers, Gas Turbines, and Reciprocating Engines

This section describes the calculations used to determine the PAL pollutant BAE from the heaters, boilers, gas turbines, and reciprocating engines.

**$\underline{SO_2}$**: For the heaters, boilers, gas turbines, and reciprocating engines identified in Table 2-2, the unadjusted $SO_2$ BAE rates were determined based on a combination of fuel flow rate, fuel sulfur content, and fuel heat content data depending upon the fuel fired. For heaters and reciprocating engines gaseous fuel flow rate is measured at the process unit level. The fuel rate at a given heater or reciprocating engine is then determined by allocating the process unit fuel rate data based on the design heat input of a given heater/engine relative to the overall process unit's design heat input rate (*i.e.*, the sum of the heater/engine design heat inputs for that unit). The fuel flow rate to boilers and gas turbines is measured at the emissions unit level. The sulfur

[5] Table 5-2, Emission Estimation Protocol for Petroleum Refineries (Version 3, April 2015)

content/$SO_2$ emissions factor applied to the fuel flow rate/heat input rate for a given heater, boiler, gas turbine or reciprocating engine were determined as follows:

- Fuel Gas: Hydrogen disulfide ("$H_2S$") and other reduced sulfur compound (*e.g.,* carbonyl sulfide and carbon disulfide) content data are combined to determine the total sulfur content. The total sulfur content is used as the basis for the emission factor (*i.e.*, lb $SO_2$/mmscf) that is applied to the fuel flow rate/heat content data.
- Liquid Propane Gas ("LPG"): The appropriate emissions factor from U.S. EPA AP-42 Table 3.2-2 for reciprocating engines and Table 3.1-2a for gas turbines is applied to the fuel rate data.
- Fuel Oil and Distillate: The appropriate emissions factor from U.S. EPA AP-42 Table 1.3.1 for fuel oil and Tables 3.1-2a and 3.3-1 for distillate firing in gas turbines and reciprocating engines, respectively, is applied to the fuel rate data.

The heaters, boilers, gas turbines, and reciprocating engines are subject to either the NSPS subpart J or Ja standards for $H_2S$ (as specified in the Consent Decree) at 40 CFR 60.104 and 60.102a, respectively, for fuel gas combustion devices, as well as, hourly and annual maximum $SO_2$ emissions limits in the current TVOP (see Table 3-1). To satisfy the requirement to downwardly adjust the BAE to exclude any emissions not in compliance with these standards, samples measuring greater than 162 ppm $H_2S$ were removed from the data used to generate the average $H_2S$ fuel content during the baseline period. The annual average of the fuel gas subject under the consent decree to subpart Ja was determined to be less than 60 ppm $H_2S$. As a result, no further adjustments were required in accordance with the annual $SO_2$ limit. For those units with fuel use limits, the fuel rate data was checked against the limit to determine any periods requiring a downward adjustment. No further adjustments were required in accordance with any fuel use limit.

As noted in Table 3-1, the heaters and boilers are subject to oil usage and sulfur content requirements. Compliance with these requirements was determined and where required downward adjustments were implemented.

**$NO_X$, VOC, CO, and PM/$PM_{10}$/$PM_{2.5}$:** The unadjusted BAE rates for $NO_X$, VOC, CO, and PM/$PM_{10}$/$PM_{2.5}$ were determined based on hourly fuel flow rate and fuel heat content and emission factors based on available stack test data, vendor guarantees, or appropriate AP-42 emissions factors. Emissions were determined by applying the appropriate emission factor to the calculated fuel firing rate in MMBtu/hr. The unadjusted BAE pollutant rate for each emissions unit represents the annual average emissions during the selected 24-month baseline period.

$NO_X$, VOC, CO, and PM/$PM_{10}$/$PM_{2.5}$ emissions from the heaters, boilers, gas turbines, and reciprocating engines were adjusted accordingly for those periods when the units were operating in excess of any applicable requirements listed in Table 3-1. Some of the heaters and gas turbines are subject to hourly $NO_X$, VOC, CO, and $PM/PM_{10}/PM_{2.5}$ limits in the current TVOP. No emissions in excess of the hourly permitted rates for $NO_X$, CO, PM, $PM_{10}$ and $PM_{2.5}$ pursuant to the current TVOP were identified for the heaters and boilers, therefore, no downward adjustments were performed. Emissions of CO and $NO_X$ in excess of hourly limits for Gas Turbines #9 and #10 were identified and were either downwardly adjusted to the applicable limits or set to zero, data permitting.

Boilers 5, 8, and 9 are subject to the applicable subpart D standard for $NO_X$ at 40 CFR 60.44 and some of the boilers are subject to lb/MMBtu and hourly $NO_X$ limits in the current TVOP. The $NO_X$ emissions from Boiler 10 are monitored using a CEMS. No downward adjustments required beyond those associated with becoming subject to the NSPS subpart D $NO_X$ standard were required on Boilers 5, 8, and 9. For Boiler 10 downward adjustments were made to the unadjusted $NO_X$ emissions to account for noncompliance with the applicable limits. No emissions in excess of the hourly permitted rates for CO, PM, $PM_{10}$ and $PM_{2.5}$ pursuant to the current TVOP were identified, therefore, no downward adjustments were performed.

### 4.3.3 Sulfur Recovery Plants ("SRP")

As shown in Table 2-2, emissions from the East and West sulfur recovery plants (SRPs) comprise emissions from the Claus Sulfur Recovery Units, Beavon Units, SRP incinerators (thermal oxidizers), sulfur pits, and Beavon Cooling Towers. The sulfur storage areas are considered separate emission units.

**Beavon Units:** The Beavon units are primarily a source of reduced sulfur compounds. PAL limits are not proposed for reduced sulfur compounds, so the BAE of these compounds was not determined. The emissions rate of other pollutants result from combustion in the Claus Unit thermal combustor and hydrogenation reactor in the Beavon Units. Emissions of these pollutants were determined using concentration and gas flow rate data. There are no applicable emissions limits for these other pollutants, so no downward adjustment was needed.

**SRP Incinerators:** This section describes the calculations used to determine the PAL pollutant BAE from the SRP incinerators.

> $\underline{SO_2}$: The unadjusted $SO_2$ emissions from the SRP incinerators were determined based on the fuel rate of the supplemental fuel fired at the incinerator, fuel sulfur content, and heat content of the fuel, and engineering estimates of the rate of total reduced sulfur ("TRS") flow to the incinerators during periods when the Beavon Units were undergoing startup and shutdown or a Beavon unit was bypassed to the incinerator due to an upset or maintenance. Monthly emissions were determined by summing the daily emissions in a

calendar month.  The BAE rate represents the annual average emissions during the selected 24-month baseline period.

The supplemental fuel that is fired into the East and West SRP incinerators are subject to the subpart J and Ja fuel gas standard for sulfur oxides at 40 CFR 60.104(a)(1) and 102a(g)(1)(ii), respectively.  $SO_2$ emissions were downwardly adjusted as described above for heaters and boilers.  No downward adjustments were needed to account for the daily mass emission rate limit in the TVOP.

$NO_X$, VOC, CO, PM/$PM_{10}$/$PM_{2.5}$:  The unadjusted BAE rates for $NO_X$, VOC, CO, and PM/$PM_{10}$/$PM_{2.5}$ were determined based on monthly fuel usage data during the selected baseline period and US EPA AP-42 emission factors for natural gas combustion. Emissions were determined by applying the appropriate emissions factor to the measured monthly fuel firing rate.  The unadjusted BAE pollutant rate for each emissions unit represents the annual average emissions during the selected 24-month baseline period.

None of the unadjusted $NO_X$, VOC, CO, and PM/$PM_{10}$/$PM_{2.5}$ emissions during the selected baseline period were determined to be non-compliant or in excess of the applicable limits presented in Table 3-1; therefore, no adjustments were made.

**Sulfur Pits:**  The unadjusted BAE rates for PM/$PM_{10}$/$PM_{2.5}$ were determined based on a measured rate of PM/$PM_{10}$/$PM_{2.5}$ exiting each of the sulfur pit vents and the recorded annual utilization of each pit.  This rate was downwardly adjusted to account for the capture efficiency of the sulfur pit control (*i.e.*, 98%).  This control is being implemented to comply with the currently applicable NSPS subpart Ja standard.

**Beavon Cooling Towers:** The unadjusted BAE rates for PM/$PM_{10}$/$PM_{2.5}$ were determined based on each towers circulation rate, concentration of total dissolved solids, drift factor, and application of the Reisman & Frisbie particle size distribution data.  There are no applicable PM/$PM_{10}$/$PM_{2.5}$ limits in the TVOP, so no downward adjustments are required.

### 4.3.4 Flares

This section describes the calculations used to determine the PAL pollutant BAE from the Flares.

**$SO_2$:** The unadjusted BAE rates were determined based on a combination of fuel flow rate and an estimate of the TRS content. The sulfur content estimate that is used was derived to support development of the work practice requirements for flares in NSPS subpart Ja.[6]

Pursuant to subpart Ja 40 CFR 60.103a(h), no fuel gas that contains $H_2S$ in excess of 162 ppm determined on a 3-hour rolling average basis can be burned in the flares. Accordingly, for any period where the $H_2S$ concentration was in excess of this limit, the total sulfur concentration would need to be reduced by the amount of the exceedance. As noted in footnote 6, the TRS content 163 ppmv was used to determine the rate of $SO_2$ emissions form the flares. Available data indicates that some portion of that amount is due to compounds other than $H_2S$. As a result, no downward adjustment was performed. Exceedances resulting from relief valve leaks or other upsets are exempt from the subpart Ja limit. As a result, during periods of upsets, no downward adjustments were required.

**CO, $NO_X$, PM/$PM_{10}$/$PM_{2.5}$**: The unadjusted BAE rates for CO, $NO_X$, and PM/$PM_{10}$/$PM_{2.5}$, emissions from the flares presented in Table 2-2, were determined based on AP-42 emissions factors for industrial flares, daily flare header flow rate, and available flare gas composition data, which was used to determine the heat content. Daily emissions were determined by applying the AP-42 emission factors to the calculated heat input. The flares are not subject to any applicable CO, $NO_X$, and PM/$PM_{10}$/$PM_{2.5}$ emissions limits so no downward adjustments were required.

**VOC:** The unadjusted BAE rates for VOC emissions from the flares presented in Table 2-2, were determined by using the daily header flow rate, available flare gas composition, and a 98 percent VOC destruction efficiency. The flares are not subject to any applicable VOC emissions limits so no downward adjustments were required.

### 4.3.5 Tanks

This section describes the calculations used to determine BAE of VOC emissions from the non-pressurized storage tanks listed in Table 2-2. The unadjusted BAE for each tank was determined using the methodology in AP-42, Fifth Edition, Volume I, Chapter 7 dated November 2006, entitled “Organic Liquid Storage Tanks." To accomplish this the 2009/2010 throughput and temperature records were used along with tank specific design and materials critical property data. Where applicable, emissions from tank roof landings during the baseline period were

[6] *See page 9* of EPA-HQ-OAR-2007-0011-0378, “Impact Estimates for Fuel Gas Combustion Device and Flare Regulatory Options for Amendments to the Petroleum Refinery NSPS,” flare gas without contributions from a coker had an average total sulfur content of 163 ppmv and flare gas with contributions from a coker had an average concentration of 464 ppmv. For purposes of this application, a concentration of 163 ppmv was conservatively used to determine the mass-based $SO_2$ emissions from the flares.

added to the normal emissions from the tanks. Emissions of PM and CO from TK-8501, pitch storage tank, were calculated using information provided in AP-42, Fifth Edition, Volume I, Chapter 11.1.

The currently applicable requirements for tanks that are subject to the NSPS subpart K, Ka or Kb standards include a limit on tank VOC true vapor pressure of 11 psia for floating roof tanks. A downward adjustment was made to the unadjusted VOC BAE to account for this currently applicable requirement.

### 4.3.6 Platformer Vents

This section describes the calculations used to determine unadjusted $SO_2$, CO and VOC BAE rates from the Platformer Vents identified in Table 2-2. As shown, there are Catalyst Regenerator Vents located on #2 Plat, #3 Plat, and #4 Plat. The $SO_2$ and CO BAE rates were determined based on the given platformer unit's design capacity, annual utilization, and a site-specific emissions factors developed from data collected as part of EPA's information collection request. The VOC BAE rate was determined by using the design capacity, annual utilization, and an emissions factor developed by EPA.[7]

### 4.3.7 Sulfuric Acid Plant

This section describes the calculations used to determine the PAL pollutant BAE rates from the Sulfuric Acid Plant (SAP). As shown in Table 2-2, the SAP is composed of two emission units, the process heater emissions unit, which includes the SAP process air heater, converter heater, and startup heater and exhausts through one stack (STK-7801) and the SAP process unit, which exhausts through a separate stack (STK-7802).

**The BAE emission rates from the process heater emissions unit were determined as follows:**

**$SO_2$:** The unadjusted hourly BAE rates were determined based on a combination of fuel flow rate, CEMS based $H_2S$ content of the fuel, and fuel heat content. The process heater emission unit is subject to the NSPS subpart J $SO_2$ standard at 40 CFR 60.104 (*i.e.*, the 162 ppmv $H_2S$ standard for fuel gas combustion devices), as well as, hourly and annual mass-based emission limits (see Table 3-1). The hourly and annual mass-based emissions limits are based on operation of the heaters at their maximum heat input rate while firing NSPS subpart J compliant fuel gas. Based on a review of the CEMS based $H_2S$ emissions and hourly mass-based emissions rate data, periods of noncompliance were identified. As a result, downward adjustments to the

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[7] Emissions Estimation Protocol for Petroleum Refineries, Version 3, April 2015, Table 5-6, page 5-19.

unadjusted BAE rates were required. The monthly emissions were determined by summing the hourly emissions in a calendar month excluding emissions from any hour where the limit was exceeded. The BAE rate represents the annual average emissions during the selected 24-month baseline period.

**CO, $NO_X$, PM/$PM_{10}$/$PM_{2.5}$, and VOC:** The unadjusted hourly BAE rates were determined based on a combination of fuel flow rate, stack test-based emissions factors, and fuel heat content. The stack test-based emissions factors were derived from the most recent performance test during which compliance with each of the limits was demonstrated. The process heater emission unit is subject to concentration and mass-based emissions limits for $NO_X$, CO, and VOC. Based on a review of the performance test results and hourly mass-based emissions rates derived using the performance test-based emission factors no periods of noncompliance were identified. As a result, no downward adjustments to the unadjusted hourly BAE rates were required. The monthly emissions were determined by summing the hourly emissions in a calendar month. The BAE rate represents the annual average emissions during the selected 24-month baseline period.

**The BAE rates from the SAP process unit emissions unit were determined as follows:**

**$SO_2$:** The unadjusted BAE rates were determined based on CEMS based $SO_2$ and exhaust gas flowrate.

As described in Section 4.2, unadjusted $SO_2$ BAE rates were evaluated to identify: 1) any BAE estimates that are in excess of newly applicable emissions limits (including work practices where appropriate) and; 2) any non-compliant emissions during the baseline period that are included in the unadjusted BAE estimates. As a result, emissions that were noncompliant with the current emissions limits were downwardly adjusted from the unadjusted values.

**$NO_X$:** The unadjusted $NO_X$ BAE rates were determined based on an hourly rate derived from a stack test (*i.e.,* performance test) and the hours of operation.

As described in Section 4.2, unadjusted $NO_X$ BAE rates were evaluated to identify: 1) any BAE estimates that are in excess of newly applicable emissions limits (including work practices where appropriate) and; 2) any non-compliant emissions during the baseline period that are included in the unadjusted BAE estimates. The performance test results were compliant with the permitted $NO_X$ limits, so no downward adjustments were performed.

### 4.3.8 Delayed Coker Vent

This section describes the calculations used to determine the PAL pollutant BAE from the Delayed Coker steam vent. The unadjusted BAE of PM/$PM_{10}$/$PM_{2.5}$, VOC, and CO emissions from the Coker steam vent are based on the annual number of coke drum cycles and per cycle emissions factors developed based on stack testing performed on this vent.[8] As shown in Table 3-1, the steam vent is subject to a work practice requirement that the coke drum not be vented to the atmosphere until the pressure in the drum has reached a pressure of 2 psig or less. This requirement occurred subsequent to the baseline period of 2009/2010, so the unadjusted emissions have been downwardly adjusted using updated emissions factors that are representative of the emissions per cycle when the drum is vented at a pressure of 2 psig.

### 4.3.9 Process Fugitives

Process fugitives includes fugitive emissions from potentially leaking equipment such as pumps, valves, connectors, pressure relief devices, open-ended lines, sampling connections and compressors as well as emissions from process drains and other wastewater treatment equipment. This section describes the calculations used to determine BAE of VOC emissions from process fugitives presented in Table 2-2. Calculation of BAE from process drains and other wastewater treatment equipment are addressed in Section 4.3.10.

Fugitive VOC emissions addressed in this section were determined using one of two different methodologies depending on whether the equipment components were monitored or unmonitored. Monitored equipment components include all components subject to LDAR requirements. Unmonitored components include components in heavy liquid service or exempt from monitoring requirements under applicable regulations (i.e., connectors in gas/vapor or light liquid, equipment not in VOC service)

**Monitored Equipment Components**

The fugitive VOC BAE from monitored equipment components were estimated using correlations found in U.S. EPA's *Protocol for Equipment Leak Emission Estimates*.[9] These correlations estimate fugitive emission rates from an equipment component as a function of the measured VOC concentrations in the immediate vicinity of the component using EPA Reference Method 21. During the 2009/2010 baseline period HOVENSA used LeakDAS, an LDAR data management software package, to manage the component monitoring data and to perform the emissions calculations. For monitored components, the LeakDAS software uses the *Modified Trapezoidal* method to estimate the fugitive VOC emissions over time.

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[8] HOVENSA Coker Steam Vent Report, Final, September 8, 2008.

[9] See *1995 Protocol for Equipment Leak Emission Estimates*; U.S. Environmental Protection Agency, Emission Standards Division, Office of Air and Radiation, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina 27711; November 1995; EPA-453/R-95-017.

The unadjusted VOC BAE from the monitored components were estimated using the above methodology based on component monitoring data and component count data from 2009 and 2010. Limetree Bay Terminals and Refining continues to utilize LeakDAS software for determining VOC emissions from these sources and will use it to support the proposed PAL monitoring and compliance tracking calculation procedures described in Section 6.3.4.9.

The unadjusted VOC BAE rates from each process unit's process fugitives and compressors were evaluated to identify: 1) any BAE estimates that are in excess of newly applicable emissions limits (including work practices where appropriate) and; 2) any non-compliant emissions during the baseline period that remain in the BAE estimates after making any necessary adjustments for newly applicable limits. Downward adjustments were made to the BAE as required to account for these situations.

Equipment components at the LBT facility are currently subject to more restrictive LDAR requirements than were applicable during the baseline period. During the baseline period, depending upon which regulation was applicable to a given process unit (*i.e.*, NSPS subpart GGG, NESHAP subpart CC, NESHAP subpart H) the facility utilized the applicable leak definition in accordance with the given process unit's regulatory applicability. Paragraph 109 of the HOVENSA Consent Decree requires a leak definition of 500 ppm VOCs for valves and 2,000 ppm for pumps be used in all of the facility's process units. This leak definition aligns with the definitions in NSPS GGGa. As a result, where applicable, the unadjusted BAE rates were downwardly adjusted to account for the more stringent leak definition. For monitored components, the downward adjustment was based on TCEQ's estimated control efficiencies for a 28M LDAR program and 28VHP.[10, 11]

Deviation reports for 2009 and 2010 were reviewed for possible deviations associated with failure to make timely repair attempts.[12] The result of the review showed that no unjustifiable delay of repair occurred and accordingly, no downward adjustments were necessary.

**Unmonitored Equipment Components**

Unadjusted VOC BAE from unmonitored components were estimated using Refinery average emissions factors applicable to each component type (*e.g.*, valves in heavy liquid service). The factors used are those found in TCEQ "Air Permit Technical Guidance for Chemical Sources -

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[10] See: https://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/fugitive-guidance.pdf

[11] Based on the facility's assessment, the work practice requirements of 28VHP are the most effective work practices applicable to subject components. Thus, adjusting BAE VOC emissions from fugitive components downward to 28VHP control levels are equivalent the requirements of NSPS subpart GGGa.

[12] Other reported deviations were determined to be procedural in nature or were not relevant in determining emissions during the baseline period and thus, they did not implicate the need to make downward adjustments to BAE.

Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18), Table II. The TCEQ refinery factors are equal to those published in EPA's *Protocol for Equipment Leak Emission Estimates, Table 2-2*.

During the baseline period pressure relief devices in heavy liquid streams (*e.g.,* No. 2 oil No. 6 oil, lube oil) were not monitored. All but the heavy liquid components will be monitored under current regulatory requirements. Adjustments were made to the unadjusted BAE to account for these differences. A 97% control efficiency is applied to the Refinery average emission factor for pressure relief valves per TCEQ guidance for control efficiency attributable to implementation of a 28 VHP LDAR program.

### 4.3.10 Wastewater Treatment

As shown in Table 2-2 wastewater related emissions comprise fugitive emissions from the Oily Water Collection System (*i.e.,* process drains) and Wastewater Treatment System (*i.e.,* API separators, WEMCO units, benzene strippers and Advanced Wastewater Treatment Plant). This section describes the calculations used to determine VOC BAE from these wastewater-related fugitive emissions sources.

**Oily Water Collection System**

Unadjusted VOC BAE from the oily water system were estimated using refinery average emission factors applicable to process drains.[13] During the 2009/2010 baseline period, the refinery was complying with NESHAP subpart FF, this required visual inspection of the drains to ensure a water seal was maintained. Accordingly, a 95% control was applied to the unadjusted BAE VOC emissions.[14]

The unadjusted VOC BAE rates were evaluated to identify: 1) any BAE estimates that were in excess of newly applicable emissions limits (including work practices where appropriate) and; 2) any non-compliant emissions during the baseline period that are included in the unadjusted BAE estimates. As shown in Table 3-1 , the oily water system at the FCCU, Coker, and LSF Unit is currently subject to the applicable standards in NSPS subpart QQQ and NESHAP subpart FF. The overall refinery is subject to the requirements of NESHAP subpart FF. Compliance with NSPS subpart QQQ required no downward adjustments to account for current requirements.

[13] The factors used are those found in TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18), Table II.

[14] Industrial Wastewater Volatile Organic Compound Emissions – Background Information for BACT/LAER Determinations, EPA-450/3-90-004, January 1990, page 4-22.

**Wastewater Treatment System**

During the 2009/2010 baseline period, the HOVENSA refinery used AP-42, Chapter 5.1 and EPA's WATER9 model to estimate fugitive VOC BAE from the wastewater treatment plant. Unadjusted VOC BAE from the API separators and the WEMCO units were determined using the factors in AP-42 Table 5.1-3 "Fugitive Emission Factors for Petroleum Refineries" for covered oil/water separators. Unadjusted VOC BAE from the benzene strippers and the advance wastewater treatment plant (*i.e.*, benzene stripper, aeration/degas tanks, clarifiers, and bioslurry) were determined using EPA WATER9. WATER9 uses analytical expressions to estimate air emissions of individual waste constituents in wastewater collection, storage, treatment, and disposal facilities. Outputs from the model include estimated VOC emissions rates at each of the locations identified as an emissions source in the model (*e.g.*, benzene strippers, aeration/degas tanks, clarifiers, and bioslurry tanks).

The unadjusted VOC BAE rates were evaluated to identify: 1) any BAE estimates that are in excess of newly applicable emissions limits (including work practices where appropriate) and; 2) any non-compliant emissions during the baseline period that are included in the unadjusted BAE estimates. In the case of the fugitive sources from the Wastewater Treatment System it was determined that no downward adjustments were needed to address new limits or non-compliant emissions.

### 4.3.11 Truck Loading Racks and Fuel Pumps

The unadjusted VOC BAE rates from the Truck Loading Racks and Fuel Pumps at the intraplant service station were determined using the procedures outlined in Chapter 5.2.2.2 and 5.2.2.3 of EPA's AP-42 regarding "Service Stations" and "Motor Vehicle Refueling" and throughput rates.

As described in Section 4.2, unadjusted VOC BAE rates were evaluated to identify: 1) any BAE estimates that are in excess of newly applicable emissions limits (including work practices where appropriate) and; 2) any non-compliant emissions during the baseline period that are included in the unadjusted BAE estimates. The Truck Loading Racks and Fuel Pumps have not become to any new applicable emission requirements since the baseline period and no periods of non-compliance were identified during the baseline period.[15] As a result, no downward adjustments to the unadjusted BAE rates were required.

[15] These facilities are currently complying with 40 CFR 63 subpart CC for truck loading racks but this requirement was not in place during the baseline period.

### 4.3.12 Marine Loading

The unadjusted VOC BAE rates from marine loading operations were calculated on a monthly basis using the procedures outlined in Chapter 5.2 of EPA's AP-42 regarding "Transportation and Marketing of Petroleum Liquids." The inputs to these calculations were the monthly loading rates of the various products during the 2009/2010 baseline period, vessel type (*i.e.*, barge, tanker, or ship), and the appropriate AP-42 for the product/vessel type combination.

As described in Section 4.2, unadjusted VOC BAE rates were evaluated to identify: 1) any BAE estimates that are in excess of newly applicable emissions limits (including work practices where appropriate) and; 2) any non-compliant emissions during the baseline period that are included in the unadjusted BAE estimates. Subsequent to the 2009/2010 baseline period, as shown in Table 3-1 the marine loading became subject to a VOC. As a result, the unadjusted VOC BAE rates were downwardly adjusted in accordance with this requirement.

### 4.3.13 Material Handling

This section describes the calculations used to determine BAE $PM/PM_{10}/PM_{2.5}$ rates from the material handling facilities identified in Table 2-2. As shown, these include BAE emissions from the East, West and Marine Sulfur Storage Areas, catalyst handling, and Coke Handling, Storage, and Loading System.

**<u>Sulfur Handling, Storage and Shipping</u>**

The unadjusted BAE rates from the conveyor drops at the sulfur storage areas and shipping operations, and from truck loading operations were determined using the procedures outlined in Chapter 13.2.4 of EPA's AP-42 regarding "Aggregate Handling and Storage Piles" and the sulfur production rate. Stockpile wind erosion emissions were determined using emission factors found in CHEER (Coal Handling Emissions Evaluation Roundtable) Workshop, TNRCC (May 16, 1995) and EPA-450/3-74-037 "Development of Emission Factors for Fugitive Dust Sources" (EPA, June 1974)

**<u>Catalyst Handling</u>**

The BAE rates from catalyst handling include emissions from hopper loading, reactor loading and reactor dumping and were determined using the procedures outlined in Chapter 13.2.4 of EPA's AP-42 regarding "Aggregate Handling and Storage Piles" and the FCCU catalyst shipping and receiving records.

**<u>Coke Handling. Storage, and Shipping</u>**

The BAE rates resulting from the coke handling, storage, and loading system's various emissions points were determined as follows:

Drop Points emissions were determined using the procedures outlined in Chapter 13.2.4 of EPA's AP-42 regarding "Aggregate Handling and Storage Piles" and maximum throughput rates and hours of annual operation.

Wet Coke Chopper emissions were determined using the emission factors and control efficiencies found in CHEER (Coal Handling Emissions Evaluation Roundtable) Workshop, TNRCC (May 16, 1995) for enclosed primary crushers, maximum throughput rates and hours of annual operation.

Dome Vent and Loading Arm Baghouse Dust Collector emissions were determined using an emissions factor that was developed by collecting and weighing the amount of dust collected over a week's time period and applying the baghouse equipment's collection efficiency. This factor was used along with the maximum flowrate through the dust collector and annual hours of operation to determine the BAE emissions.

Conveyor Exhaust emission were determined using the procedures outlined in Chapter 13.2.4 of EPA's AP-42 regarding "Aggregate Handling and Storage Piles", the individual conveyors length and the annual coke handling rates.

As described in Section 4.2, unadjusted $PM/PM_{10}/PM_{2.5}$ BAE rates were evaluated to identify: 1) any BAE estimates that are in excess of newly applicable emissions limits (including work practices where appropriate) and; 2) any non-compliant emissions during the baseline period that are included in the unadjusted BAE estimates. The material handling systems have not become subject to any new applicable emission limits since the baseline period and no periods of non-compliance were identified during the baseline period. As a result, no downward adjustments to the unadjusted BAE rates were performed.

### 4.3.14 Road Traffic

The BAE rates from road traffic were determined using the procedures outlined in Chapter 13.2.1 of EPA's AP-42 regarding "Paved Roads" and data related to the annual vehicle miles travelled and average weight of a vehicle. The BAE rates developed for this application are based on the updated AP-42 factors.

As described in Section 4.2, unadjusted $PM/PM_{10}/PM_{2.5}$ BAE rates were evaluated to identify: 1) any BAE estimates that are in excess of newly applicable emissions limits (including work practices where appropriate) and; 2) any non-compliant emissions during the baseline period that are included in the unadjusted BAE estimates. Road traffic emissions have not become subject to any new applicable emission limits since the baseline period and there are no applicable emissions limits or design requirements. As a result, no downward adjustments to the unadjusted BAE rates were required.

### 4.3.15 Painting

The unadjusted BAE rates of VOC from painting were determined based upon an inventory of the paints and thinners used during the baseline period and the VOC content of each. All of the VOC content was assumed to be released to the atmosphere.

As described in Section 4.2, unadjusted BAE rates were evaluated to identify: 1) any BAE estimates that are in excess of newly applicable emissions limits (including work practices where appropriate) and; 2) any non-compliant emissions during the baseline period that are included in the unadjusted BAE estimates. Emissions resulting painting have not become subject to any new applicable emission limits or work practices since the baseline period and there are no applicable emissions limits or work practice requirements. As a result, no downward adjustments to the unadjusted BAE rates were required.

### 4.3.16 Fire Training

The BAE rates from Fire Training were determined using the procedures outlined in Chapter IV. C “Firefighting Training” of the “Calculation Methods for Criteria Air Pollutant Emission Inventories", Brooks Air Force Base, TX, July 1994, and data related to the amount of fuels consumed during the training.

As described in Section 4.2, unadjusted BAE rates were evaluated to identify: 1) any BAE estimates that are in excess of newly applicable emissions limits (including work practices where appropriate) and; 2) any non-compliant emissions during the baseline period that are included in the unadjusted BAE estimates. Emissions resulting from fire training have not become subject to any new applicable emission limits since the baseline period and there are no applicable emissions limits or design requirements. As a result, no downward adjustments to the unadjusted BAE rates were required.

# 5.0 PROPOSED PALS

Table 5-1 contains the proposed Pollutant PALs for the Limetree Bay Terminals and Refining facility. Consistent with 40 CFR 52.21(aa)(6), each proposed PAL is based on the sum of adjusted BAE by emissions unit, as documented in Appendix B, plus the applicable significant level. For each emissions unit on which actual construction began after the 24-month baseline period, the unit's emissions have been added to the PAL level in the amount equal to its PTE.

**Table 5-1. Proposed PALs**

| Pollutant | BAE | Pollutant Significant Level | Proposed PAL |
|---|---|---|---|
| | TPY | TPY | TPY |
| VOC | 6,143 | 40 | 6,183 |
| $NO_X$ | 6,577 | 40 | 6,617 |
| CO | 3,320 | 100 | 3,420 |
| $PM_{2.5}$ | 421 | 10 | 431 |
| $PM_{10}$ | 429 | 15 | 444 |
| PM | 459 | 25 | 484 |
| $SO_2$ | 1,586 | 40 | 1,626 |

# 6.0 PROPOSED PAL CALCULATION PROCEDURES

In accordance with paragraph 40 CFR 52.21(aa)3)(iii), the following information must be submitted to the agency as part of a complete PAL permit application:

> *The calculation procedures that the major stationary source owner or operator proposes to use to convert the monitoring system data to monthly emissions and annual emissions based on a 12-month rolling total for each month. . .*

In addition, although there are no requirements pertaining to the permit application in this regard, paragraph (aa)(12)(i) contains requirements that must be met in order for the PAL permit to be valid:

*(a)* *Each PAL permit must contain enforceable requirements for the monitoring system that accurately determines plantwide emissions of the PAL pollutant in terms of mass per unit of time or* $CO_2e$ *per unit of time. Any monitoring system authorized for use in the PAL permit must be based on sound science and meet generally acceptable scientific procedures for data quality and manipulation. Additionally, the information generated by such system must meet minimum legal requirements for admissibility in a judicial proceeding to enforce the PAL permit.*

*(b)* *The PAL monitoring system must employ one or more of the four general monitoring approaches meeting the minimum requirements set forth in paragraphs (aa)(12)(ii)(a) through (d) of this section and must be approved by the Administrator.*

*(c)* *Notwithstanding paragraph (aa)(12)(i)(b) of this section, you may also employ an alternative monitoring approach that meets paragraph (aa)(12)(i)(a) of this section if approved by the Administrator.*

Anticipated PAL monitoring and recordkeeping requirements for each PAL pollutant-emitting emissions unit and proposed calculation procedures at the Limetree Bay Terminals and Refining are documented in Table 6-1 with references to supporting details contained in Sections 6.1 through 6.3. The following specific information is provided for each emissions unit/PAL pollutant:

- Process Unit;
- Source Identification (ID);
- Unit Description;
- Proposed Compliance Determination Method (*i.e.,* CEMS, CPMS/PEMS, or Emissions Factor) for each PAL Pollutant; and
- Proposed Calculation Method.

Process Unit, Source Identification, Unit Description, and PAL Pollutant: This information is provided in Section 2.0.

Proposed Monitoring General Approach: The PAL monitoring system imposed in the PAL permit must use one or more of the following four general monitoring approaches meeting the minimum requirements in 40 CFR 52.21(aa)(12)(ii)(a)-(d): mass balance calculations for activities using coatings or solvents; CEMS; CPMS or PEMS; and emission factors. Anticipated monitoring requirements for all emissions units are presented in Sections 6.1 through 6.3, and these monitoring approaches are the basis for the proposed calculation procedures.

Proposed Monitoring and Calculation Procedures: A cross-reference to the monitoring and calculation approach detailed in Sections 6.1 through 6.3 is provided.

Limetree Bay Terminals and Refining has reviewed the monitoring, calculation, and recordkeeping requirements in Permit No. STX-TV-003-10 and has determined that these requirements generally satisfy the requirements of 40 CFR 52.21. Thus, the proposed PAL monitoring and calculation procedures are consistent with the requirements already being implemented at the Limetree Bay Terminals and Refining facility. Specific requirements related to monitoring in 40 CFR 52.21 are addressed in Sections 6.1 through 6.3. Absence of monitoring data procedures are addressed in Sections 6.4. PAL permit recordkeeping is addressed in Section 6.5.

## Table 6-1. Proposed PAL Monitoring and Calculation Procedures

| Process Unit / Activity | Source ID | Unit Description | Proposed Compliance Demonstration Method for Listed Pollutant [a] | | | Reference Section for Proposed Monitoring & Calculation Method |
|---|---|---|---|---|---|---|
| | | | CEMS | CPMS/ PEMS | Emissions Factor | |
| #2 DU | #2 DU Process Unit | Process Fugitives | | | VOC | 6.3.4.9 |
| #2 DU Fractionator | H-101 | Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #2 DU Fractionator | H-104 | Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #2 CDU | #2 CDU Process Unit | Process Fugitives | | | VOC | 6.3.4.9 |
| #2 CDU | H-401A | Charge Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #2 CDU | H-401B | Charge Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #2 CDU | H-401C | Charge Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #3 CDU/1 VAC | #3 CDU & 1 VAC Process Unit | Process Fugitives | | | VOC | 6.3.4.9 |
| #3 DD | #3 DD | Process Fugitives | | | VOC | 6.3.4.9 |
| #3 DD | C-1500A | Reciprocating Gas Compressor | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #3 DD | C-1500B | Reciprocating Gas Compressor | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #3 DD | C-1500C | Reciprocating Gas Compressor | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| Penex | Penex Process Unit | Process Fugitives | | | VOC | 6.3.4.9 |
| Penex | H-200 | Charge Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| Penex | H-201 | Fired Reboiler Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| Penex | H-202 | Hot Oil Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| Penex | C-200A | Reciprocating Gas Compressor | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| Penex | C-200B | Reciprocating Gas Compressor | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |

| Process Unit / Activity | Source ID | Unit Description | Proposed Compliance Demonstration Method for Listed Pollutant [a] CEMS | CPMS/ PEMS | Emissions Factor | Reference Section for Proposed Monitoring & Calculation Method |
|---|---|---|---|---|---|---|
| Penex | C-200C | Reciprocating Gas Compressor | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #3 Amine | Unit No. 0920 | Amine Unit | | | VOC | 6.3.4.9 |
| Utility Fractionation | Utility Fractionation Process Unit | Process Fugitives | | | VOC | 6.3.4.9 |
| Utility Fractionation | H-160 | Charge Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #2 Platformer | #2 Platformer Process Unit | Process Fugitives | | | VOC | 6.3.4.9 |
| #2 Platformer | H-601 | Stripper Reboiler Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #2 Platformer | H-604 | Platforming No. 2 Interheater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #2 Platformer | H-605 | Platforming No. 3 Interheater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #2 DU | #2 DU Process Unit | Process Fugitives | | | VOC | 6.3.4.9 |
| #2 DU | H-800A | Reactor Charge Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #2 DU | H-800B | Reactor Charge Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #2 DU | H-801 | Stripper Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #4 DD | #4 DD Process Unit | Process Fugitives | | | VOC | 6.3.4.9 |
| #4 DD | H-2201A | Reactor Charge Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #4 DD | H-2201B | Reactor Charge Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #4 DD | H-2202 | Stripper Reboiler Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #5 DD | #5 DD Process Unit | Process Fugitives | | | VOC | 6.3.4.9 |
| #5 DD | H-2400 | Charge Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #5 DD | C-2400A | Reciprocating Gas Compressor | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #5 DD | C-2400B | Reciprocating Gas Compressor | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |

| Process Unit / Activity | Source ID | Unit Description | Proposed Compliance Demonstration Method for Listed Pollutant [a] | | | Reference Section for Proposed Monitoring & Calculation Method |
|---|---|---|---|---|---|---|
| | | | CEMS | CPMS/ PEMS | Emissions Factor | |
| Naphtha Fractionation | Naphtha Frac. Process Unit | Process Fugitives | | | VOC | 6.3.4.9 |
| Naphtha Fractionation | H-2501 | Reboiler Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #2 Platformer | #2 Plat Vent | Plat No. 2 Catalyst Regen Vent | | | $SO_2$, CO, & VOC | 6.3.4.6 |
| #1 Gas Recovery Unit | Unit No. 2300 | Gas Stripper | | | VOC | 6.3.4.9 |
| #2 Sulfolane | #2 Sulfolane Process Unit | Process Fugitive | | | VOC | 6.3.4.9 |
| #2 Sulfolane | H-4502 | Benzene Column Reboiler Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #2 Sulfolane | H-4503 | Toluene Column Reboiler Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #2 Sulfolane | H-4504 | Xylene Column Reboiler Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #2 Sulfolane | H-4505 | Raffinate Splitter Reboiler Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #5 CDU | #5 CDU Process Unit | Process Fugitives | | | VOC | 6.3.4.9 |
| #5 CDU | H-3101A | Crude Charge Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #5 CDU | H-3101B | Crude Charge Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #6 CDU | #6 CDU Process Unit | Process Fugitives | | | VOC | 6.3.4.9 |
| #6 CDU | H-4101A | Crude Charge Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #6 CDU | H-4101B | Crude Charge Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| Disulfide | Disulfide Process Unit | Process Fugitives | | | VOC | 6.3.4.9 |
| Gas Treatment | Unit No. 3200 | Gas Treating | | | VOC | 6.3.4.9 |
| Gas Treatment | Unit No. 4800 | Gas Treating | | | VOC | 6.3.4.9 |
| Gas Treatment | Unit No. 5800 | Gas Treating | | | VOC | 6.3.4.9 |
| #3 Platformer | #3 Platformer Process Unit | Process Fugitives | | | VOC | 6.3.4.9 |
| #3 Platformer | H-4401 | Charge Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |

| Process Unit / Activity | Source ID | Unit Description | Proposed Compliance Demonstration Method for Listed Pollutant [a] CEMS | CPMS/ PEMS | Emissions Factor | Reference Section for Proposed Monitoring & Calculation Method |
|---|---|---|---|---|---|---|
| #3 Platformer | H-4402 | Fired Reboiler Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #3 Platformer | H-4451 | Charge Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #3 Platformer | H-4452 | Intermediate Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #3 Platformer | H-4453 | Intermediate Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #3 Platformer | H-4454 | Intermediate Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #3 Platformer | H-4455 | Fired Reboiler Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #3 VAC | #3 VAC Process Unit | Process Fugitives | | | VOC | 6.3.4.9 |
| #3 VAC | H-4201 | Prestripper Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #3 VAC | H-4202 | Vacuum Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #4 Platformer | #4 Platformer Process Unit | Process Fugitives | | | VOC | 6.3.4.9 |
| #4 Platformer | H-5401 | Charge Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #4 Platformer | H-5402 | Fired Reboiler Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #4 Platformer | H-5451 | Charge Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #4 Platformer | H-5452 | Intermediate Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #4 Platformer | H-5453 | Intermediate Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #4 Platformer | H-5454 | Intermediate Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #4 Platformer | H-5455 | Fired Reboiler Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #6 DD | #6 DD Process Unit | Process Fugitives | | | VOC | 6.3.4.9 |
| #6 DD | H-4601A | Reactor Charge Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |

| Process Unit / Activity | Source ID | Unit Description | Proposed Compliance Demonstration Method for Listed Pollutant [a] CEMS | CPMS/ PEMS | Emissions Factor | Reference Section for Proposed Monitoring & Calculation Method |
|---|---|---|---|---|---|---|
| #6 DD | H-4601B | Reactor Charge Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #6 DD | H-4602 | Stripper Reboiler Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #6 DD | C-4601A | Reciprocating Gas Compressor | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #6 DD | C-4601B | Reciprocating Gas Compressor | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #6 DD | C-4601C | Reciprocating Gas Compressor | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #7 DD | #7 DD Process Unit | Process Fugitives | | | VOC | 6.3.4.9 |
| #7 DD | H-4301A | Reactor Charge Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #7 DD | H-4301B | Reactor Charge Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #7 DD | H-4302 | Stripper Reboiler Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #9 DD | #9 DD Process Unit | Process Fugitives | | | VOC | 6.3.4.9 |
| #9 DD | H-5301A | Reactor Charge Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #9 DD | H-5301B | Reactor Charge Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| #9 DD | H-5302 | Stripper Reboiler Heater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| LSG Unit | LSG Unit Process Unit | Process Fugitives | | | VOC | 6.3.4.9 |
| LSG Unit | H-4901 | Charge Heater | $NO_X$ | $SO_2$[b] | $SO_2$[c] PM, CO, & VOC | 6.1, 6.2 & 6.3.4.2 |
| #3 Platformer | #3 Plat Vent | Plat No. 3 Catalyst Regen Vent | | | $SO_2$, CO, & VOC | 6.3.4.6 |
| #4 Platformer | #4 Plat Vent | Plat No. 4 Catalyst Regen Vent | | | $SO_2$, CO, & VOC | 6.3.4.6 |
| Alkylation Unit & Acid Plant | Unit No. 7200 | Process Fugitives | | | VOC | 6.3.4.9 |
| Dimersol Unit | Unit No. 7300 | Process Fugitives | | | VOC | 6.3.4.9 |
| FCCU and Gas Concentration | FCCU Process Unit and Unit No. 7100 | Process Fugitives | | | VOC | 6.3.4.9 |

| Process Unit / Activity | Source ID | Unit Description | Proposed Compliance Demonstration Method for Listed Pollutant [a] CEMS | CPMS/ PEMS | Emissions Factor | Reference Section for Proposed Monitoring & Calculation Method |
|---|---|---|---|---|---|---|
| FCCU | FCCU stack STK-7051 | Fluid Catalytic Cracking | $SO_2$, $NO_X$, & CO | | PM, VOC, & $H_2SO_4$ | 6.1, 6.2 & 6.3.4.2 |
| Deiso-Hexanizer | Deiso-Hexanizer Process Unit | Process Fugitives | | | VOC | 6.3.4.9 |
| #3, 4, 5 Amine and T-931 | #3, 4, 5 Amine Process Unit | Process Fugitives | | | VOC | 6.3.4.9 |
| #6 & 7 Amine and SHU | Unit No. 7450 and Unit No. 7600 | Process Fugitives | | | VOC | 6.3.4.9 |
| Merox Unit | Unit No. 7500 | Process Fugitives | | | VOC | 6.3.4.9 |
| 1&2 GRU/$H_2$ CON | 1&2 GRU/$H_2$ CON | Process Fugitives | | | VOC | 6.3.4.9 |
| 1&2 LPG Treater | 1&2 LPG Treater | Process Fugitives | | | VOC | 6.3.4.9 |
| 3 LPG Fractionator | 3 LPG Fractionator | Process Fugitives | | | VOC | 6.3.4.9 |
| Light Ends Treater | Light Ends Treater | Process Fugitives | | | VOC | 6.3.4.9 |
| MTBE | MTBE | Process Fugitives | | | VOC | 6.3.4.9 |
| TAME | TAME | Process Fugitives | | | VOC | 6.3.4.9 |
| Selective Hydro | Selective Hydro | Process Fugitives | | | VOC | 6.3.4.9 |
| 1 Beavon / 1&2 SRU | 1 Beavon / 1&2 SRU | Process Fugitives | | | VOC | 6.3.4.9 |
| 2 Beavon / 3&4 SRU | 2 Beavon / 3&4 SRU | Process Fugitives | | | VOC | 6.3.4.9 |
| SRU | SRU | Process Fugitives | | | VOC | 6.3.4.9 |
| 3 SWS | 3 SWS | Process Fugitives | | | VOC | 6.3.4.9 |
| 4 SWS | 4 SWS | Process Fugitives | | | VOC | 6.3.4.9 |
| 5 SWS | 5 SWS | Process Fugitives | | | VOC | 6.3.4.9 |
| 6 SWS | 6 SWS | Process Fugitives | | | VOC | 6.3.4.9 |
| East Fuel Gas System | East Fuel Gas System | Process Fugitives | | | VOC | 6.3.4.9 |
| West Fuel Gas System | West Fuel Gas System | Process Fugitives | | | VOC | 6.3.4.9 |
| Terminal | Terminal (Offsites/ Rundowns/xfers) | Process Fugitives | | | VOC | 6.3.4.9 |
| Sulfuric Acid Plant | STK-7801 (H-7801, H-7802, R-7801 | Heater Stack | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.1, 6.2, & 6.3.4.7 |
| Sulfuric Acid Plant | STK-7802 | Process Stack | $SO_2$ | | $SO_2$, $NO_X$ | 6.1 & 6.3.4.7 |
| West Sulfur Recovery | Unit Nos. 1030 & 1040, H-1061, T-1061, | Sulfur Recovery and Tail Gas Treatment Units | $SO_2$ | | $NO_X$, CO, PM, & VOC | 6.1 & 6.3.4.3 |

| Process Unit / Activity | Source ID | Unit Description | Proposed Compliance Demonstration Method for Listed Pollutant [a] CEMS | CPMS/ PEMS | Emissions Factor | Reference Section for Proposed Monitoring & Calculation Method |
|---|---|---|---|---|---|---|
| | H-1032, H-1042 & Beavon CT #1 | | | | | |
| East Sulfur Recovery | Unit Nos. 4740 & 4750, H-4761, T-4761, H-4745 & Beavon CT #2 | Sulfur Recovery and Tail Gas Treatment Units | $SO_2$ | | $NO_X$, CO, PM, & VOC | 6.1 & 6.3.4.3 |
| West Refinery Process Drains | Oily Water Collection System | Process Drain Fugitives | | | VOC | 6.3.4.10 |
| East Refinery Process Drains | Oily Water Collection System | Process Drain Fugitives | | | VOC | 6.3.4.10 |
| FCC Complex / Delayed Coker Unit | Oily Water Collection System | Process Drain Fugitives | | | VOC | 6.3.4.10 |
| Terminal | Oily Water Collection System | Process Drain Fugitives | | | VOC | 6.3.4.9 |
| Advanced Wastewater Treatment Plant | #1 API (Unit No. 1660) | Oil/Water Separator | | | VOC | 6.3.4.10 |
| | #1 WEMCO | Induced Air Floatation Unit | | | | |
| | #1 Lagoon | Aerated Lagoon | | | | |
| | #2 API (Unit No. 1661) | Oil/Water Separator | | | | |
| | #2 WEMCO | Induced air floatation unit | | | | |
| | #2 Lagoon | Aerated lagoon | | | | |
| | West Benzene Stripper (STK-3510) | Air Stripper | | | | |
| | #3 API (Unit No. 1662) | Oil/Water Separator | | | | |
| | #3 WEMCO | Induced air floatation unit | | | | |
| | #3 Lagoon | Aerated lagoon | | | | |
| | East Benzene Stripper (STK-3530) | Air Stripper | | | | |
| | Advance Wastewater Treatment | Advanced Wastewater Treatment Plant | | | | |
| West Sulfur Storage Area | Materials Handling | Materials Handling | | | PM | 6.3.4.13 |
| East Sulfur Storage Area | Materials Handling | Materials Handling | | | PM | 6.3.4.13 |

| Process Unit / Activity | Source ID | Unit Description | Proposed Compliance Demonstration Method for Listed Pollutant [a] | | | Reference Section for Proposed Monitoring & Calculation Method |
|---|---|---|---|---|---|---|
| | | | CEMS | CPMS/ PEMS | Emissions Factor | |
| Sulfur Storage, Handling & Shipping | Materials Handling | Materials Handling | | | PM | 6.3.4.13 |
| Catalyst Handling | Materials Handling | Materials Handling | | | PM | 6.3.4.13 |
| Road Dust | Road Dust | Road Dust | | | | 6.3.4.14 |
| Painting | Painting | Painting | | | | 6.3.4.15 |
| Firefighter Training | Firefighter Training | Firefighter Training | | | | 6.3.4.16 |
| West-side Refinery Flare System | #2 Flare (H-1105)<br>#3 Flare (H-1104) | H-1105 - Gas burner<br>H-1104 – Gas Burner | TRS/$SO_2$ | | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.1 & 6.3.4.4 |
| East-side Refinery Flare System | #5 Flare (H-3351)<br>#6 Flare (H-3352)<br>#7 Flare (H-3301) | H-3351 - Gas burner<br>H-3352 - Gas burner<br>H-3301 - Gas burner | TRS/$SO_2$ | | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.1 & 6.3.4.4 |
| LPG Flare System | LPG Flare (STK 7921) | Gas burner, steam assisted | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3 |
| FCC/Coker Refinery Flare System | FCC Flare (L.P. Flare - STK 7941)<br>Ground Flare (H.P. Flare - STK 7942) | Gas burner, steam assisted<br><br>Gas burner | TRS/$SO_2$ | | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.1 & 6.3.4.4 |
| Delayed Coker Unit | Delayed Coker Unit Process Unit | Process Fugitives | | | VOC | 6.3.4.9 |
| Delayed Coker Unit | H-8501A | Coker process heater 1 | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| Delayed Coker Unit | H-8501B | Coker process heater 2 | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| Delayed Coker Unit | TK-8501 (Hot Pitch Tank) | Fixed roof storage tank | | | PM & VOC | 6.3.4.5 |
| Coker Complex | Coke handling, storage, & loading system | Transportation & breaking of solid coke between drums and dock | | | PM | 6.3.4.12 |
| Coker Complex | Tank TK-8511 and recycling system | Tank TK-8511 & recycling system | | | VOC | 6.3.4.5 |
| Coker Complex | Delayed Coker Steam Vent | Delayed Coker Steam Vent | | | PM, VOC, CO, & $SO_2$ | 6.3.4.8 |
| Utilities (Powerhouse and Boilers) | Utilities (Powerhouse and Boilers) | Process Fugitives | | | VOC | 6.3.4.9 |

| Process Unit / Activity | Source ID | Unit Description | Proposed Compliance Demonstration Method for Listed Pollutant [a] | | | Reference Section for Proposed Monitoring & Calculation Method |
|---|---|---|---|---|---|---|
| | | | CEMS | CPMS/ PEMS | Emissions Factor | |
| Utility II | #5 Boiler (B-1155) | Boiler; Produces Steam | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| Utility III | #6 Boiler (B-3301) | Boiler; Produces Steam | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| Utility III | #7 Boiler (B-3302) | Boiler; Produces Steam | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| Utility III | #8 Boiler (B-3303) | Boiler; Produces Steam | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| Utility III | #9 Boiler (B-3304) | Boiler; Produces Steam | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| Utility III | #10 Boiler (B-3701) | Boiler; Produces Steam | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| Powerhouse 2 | GT No. 4 (G-3404) | Turbine; Produces Electricity | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| Powerhouse 2 | GT No. 5 (G-3405) | Turbine; Produces Electricity | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| Powerhouse 2 | GT No. 7 (G-3407) | Turbine; Produces Electricity | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| Powerhouse 2 | GT No. 8 (G-3408) | Turbine; Produces Electricity | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| Powerhouse 2 | GT No. 9 (G-3409) | Turbine; Produces Electricity | $NO_X$ & CO | $SO_2$[b] | $SO_2$,[c] PM, & VOC | 6.1, 6.2, & 6.3.4.2 |
| Powerhouse 2 | GT No. 10 (G-3410) | Turbine; Produces Electricity | $NO_X$ & CO | $SO_2$[b] | $SO_2$,[c] PM, & VOC | 6.1, 6.2, & 6.3.4.2 |
| GT No. 13 and Duct Burner | GT No. 13 (G-3413 & H-3413) | Turbine; Produces Electricity and Duct burner | $NO_X$ & CO | $SO_2$[b] | $SO_2$,[c] PM, CO, & VOC | 6.1, 6.2, & 6.3.4.2 |
| Tank | TK-01PR | Internal Floating Roof Tank | | | VOC | 6.3.4.5 |
| Tank | TK-02PR | Internal Floating Roof Tank | | | VOC | 6.3.4.5 |
| Tank | TK-03PR | Fixed Roof Tank | | | VOC | 6.3.4.5 |
| Tank | TK-04PR | Fixed Roof Tank | | | VOC | 6.3.4.5 |
| Tank | TK-05PR | Fixed Roof Tank | | | VOC | 6.3.4.5 |
| Tank | TK-06PR | Fixed Roof Tank | | | VOC | 6.3.4.5 |
| Tank | TK-07PR | Fixed Roof Tank | | | VOC | 6.3.4.5 |
| Tank | TK-0702 | Fixed Roof Tank | | | VOC | 6.3.4.5 |
| Tank | TK-1066 | Fixed Roof Tank | | | VOC | 6.3.4.5 |

| Process Unit / Activity | Source ID | Unit Description | Proposed Compliance Demonstration Method for Listed Pollutant [a] | | | Reference Section for Proposed Monitoring & Calculation Method |
|---|---|---|---|---|---|---|
| | | | CEMS | CPMS/ PEMS | Emissions Factor | |
| Tank | TK-1071 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-1118 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-1151 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-1156 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-1157 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-1201 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-1202 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-1203 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-1204 | Horizontal | | | VOC | 6.3.4.5 |
| Tank | TK-1205 | Horizontal | | | VOC | 6.3.4.5 |
| Tank | TK-1206 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-1207 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-1208 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-1236 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-1302 | Horizontal | | | VOC | 6.3.4.5 |
| Tank | TK-1302 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-1304 | Horizontal | | | VOC | 6.3.4.5 |
| Tank | TK-1305 | Horizontal | | | VOC | 6.3.4.5 |
| Tank | TK- 1401 | Fixed | | | VOC | 6.3.4.5 |
| Tank | TK-1600 | Fixed | | | VOC | 6.3.4.5 |
| Tank | TK-1621 | Fixed | | | VOC | 6.3.4.5 |
| Tank | TK-1621 | Fixed | | | VOC | 6.3.4.5 |
| Tank | TK-1626 | Horizontal | | | VOC | 6.3.4.5 |
| Tank | TK-1627 | Horizontal | | | VOC | 6.3.4.5 |
| Tank | TK-1628 | Horizontal | | | VOC | 6.3.4.5 |
| Tank | TK-1629 | Horizontal | | | VOC | 6.3.4.5 |
| Tank | TK-1630 | Horizontal | | | VOC | 6.3.4.5 |
| Tank | TK-1631 | Horizontal | | | VOC | 6.3.4.5 |
| Tank | TK-1632 | Horizontal | | | VOC | 6.3.4.5 |
| Tank | TK-1633 | Horizontal | | | VOC | 6.3.4.5 |
| Tank | TK-1653 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-1663 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-2653 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-2654 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-3201 | Fixed Roof Tank | | | VOC | 6.3.4.5 |

| Process Unit / Activity | Source ID | Unit Description | Proposed Compliance Demonstration Method for Listed Pollutant [a] | | | Reference Section for Proposed Monitoring & Calculation Method |
|---|---|---|---|---|---|---|
| | | | CEMS | CPMS/ PEMS | Emissions Factor | |
| Tank | TK-3202 | Fixed Roof Tank | | | VOC | 6.3.4.5 |
| Tank | TK-3203 | Fixed Roof Tank | | | VOC | 6.3.4.5 |
| Tank | TK-3204 | Fixed Roof Tank | | | VOC | 6.3.4.5 |
| Tank | TK-3205 | Fixed Roof Tank | | | VOC | 6.3.4.5 |
| Tank | TK-3208 | Fixed Roof Tank | | | VOC | 6.3.4.5 |
| Tank | TK-3209 | Horizontal Tank | | | VOC | 6.3.4.5 |
| Tank | TK-3301 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-3302 | Geodesic Dome | | | VOC | 6.3.4.5 |
| Tank | TK-3304 | Fixed Roof | | | VOC | 6.3.4.5 |
| | TK-3305 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-3306 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-3384 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-3385 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-3386 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-4501 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-4502 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-4503 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6801 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6802 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6803 | External Floating | | | VOC | 6.3.4.5 |
| Tank | TK-6804 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6805 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6806 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6807 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6808 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6809 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6810 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6811 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6812 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6813 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6814 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6815 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6816 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6817 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6818 | Fixed Roof | | | VOC | 6.3.4.5 |

| Process Unit / Activity | Source ID | Unit Description | Proposed Compliance Demonstration Method for Listed Pollutant [a] CEMS | CPMS/ PEMS | Emissions Factor | Reference Section for Proposed Monitoring & Calculation Method |
|---|---|---|---|---|---|---|
| Tank | TK-6819 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6820 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6821 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6822 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6823 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6824 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6825 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6831 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6832 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6833 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6834 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6835 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6836 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6837 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6838 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6839 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6840 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6841 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6842 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6843 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6851 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6852 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6853 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6854 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6858 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6859 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6860 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6871 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6872 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6873 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6874 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6875 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6876 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6877 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6880 | Fixed Roof | | | | |

| Process Unit / Activity | Source ID | Unit Description | Proposed Compliance Demonstration Method for Listed Pollutant [a] | | | Reference Section for Proposed Monitoring & Calculation Method |
|---|---|---|---|---|---|---|
| | | | CEMS | CPMS/ PEMS | Emissions Factor | |
| Tank | TK-6881 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6883 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6884 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6887 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-6888 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7051 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7201 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7206 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7207 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7208 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7209 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7210 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7211 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7301 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7302 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7401 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7402 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7403 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7404 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7405 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7406 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7407 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7408 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7409 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7410 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7411 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7412 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7413 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7414 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7415 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7416 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7417 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7418 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7421 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7422 | Fixed Roof | | | VOC | 6.3.4.5 |

| Process Unit / Activity | Source ID | Unit Description | Proposed Compliance Demonstration Method for Listed Pollutant [a] | | | Reference Section for Proposed Monitoring & Calculation Method |
|---|---|---|---|---|---|---|
| | | | CEMS | CPMS/ PEMS | Emissions Factor | |
| Tank | TK-7423 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7424 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7425 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7426 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7427 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7428 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7429 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7430 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7431 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7432 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7433 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7434 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7435 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7436 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7437 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7438 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7439 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7440 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7441 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7443 | External Floating | | | VOC | 6.3.4.5 |
| Tank | TK-7444 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7445 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7446 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7447 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7448 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7449 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7451 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7452 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7453 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7454 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7455 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7456 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7501 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7502 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7503 | Fixed Roof | | | VOC | 6.3.4.5 |

| Process Unit / Activity | Source ID | Unit Description | Proposed Compliance Demonstration Method for Listed Pollutant [a] | | | Reference Section for Proposed Monitoring & Calculation Method |
|---|---|---|---|---|---|---|
| | | | CEMS | CPMS/ PEMS | Emissions Factor | |
| Tank | TK-7504 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7505 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7506 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7507 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7508 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7509 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7510 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7511 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7512 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7513 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7514 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7515 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7516 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7517 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7521 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7522 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7523 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7524 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7525 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7526 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7528 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7541 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7542 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7571 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7601 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7602 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7603 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7604 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7605 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7933 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7934 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7943 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7956 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7966 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7973 | External Floating Roof | | | VOC | 6.3.4.5 |

| Process Unit / Activity | Source ID | Unit Description | Proposed Compliance Demonstration Method for Listed Pollutant [a] CEMS | CPMS/ PEMS | Emissions Factor | Reference Section for Proposed Monitoring & Calculation Method |
|---|---|---|---|---|---|---|
| Tank | TK-7974 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-S-7974 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7975 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-S-7975 | External Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7976 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-7986 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-8001 | Internal Floating Roof | | | VOC | 6.3.4.5 |
| Tank | TK-8002 | Internal Floating Roof | | | VOC, CO, & PM | 6.3.4.5 |
| Tank | TK-8501 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-8503 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-8505 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-8508 | Horizontal | | | VOC | 6.3.4.5 |
| Tank | TK-8511 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-8701 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | UTT1 | Fixed Roof | | | VOC | 6.3.4.5 |
| Tank | TK-D290 (frmly D1301) | Horizontal | | | VOC | 6.3.4.5 |
| Tank | TKD-1609 | Horizontal | | | VOC | 6.3.4.5 |
| Tank | TKD-1610 | Horizontal | | | VOC | 6.3.4.5 |
| Tank | TKD-1620 | UST/Horizontal | | | VOC | 6.3.4.5 |
| Seawater & Desal Water Pumps | PD-1602 | Seawater intake pump | | | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| Seawater & Desal Water Pumps | PD-1603 | Seawater intake pump | | | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| Seawater & Desal Water Pumps | PD-1604 | Seawater intake pump | | | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| Seawater & Desal Water Pumps | PD-1605 | Seawater intake pump | | | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| Seawater & Desal Water Pumps | PD-1620 | Seawater intake pump | | | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| Marine Loading | Unit No. 1600 | Ship loading & unloading | | | VOC | 6.3.4.12 |
| Truck Loading Rack | Unit No. 1651 | Dispense liquid & gaseous fuel to tank trucks | | | VOC | 6.3.4.11 |
| Fuel Pumps | Gasoline Service Station | Dispense gasoline & diesel | | | VOC | 6.3.4.11 |

| Process Unit / Activity | Source ID | Unit Description | Proposed Compliance Demonstration Method for Listed Pollutant [a] | | | Reference Section for Proposed Monitoring & Calculation Method |
|---|---|---|---|---|---|---|
| | | | CEMS | CPMS/ PEMS | Emissions Factor | |
| Piping | Unit No. 1902 | East/West fuel gas system | | | VOC | 6.3.4.9 |
| Piping | Unit No. 3303 | East/West fuel gas system | | | VOC | 6.3.4.9 |
| Storage Pile & Conveyor | N/A | Sulfur storage & Ship Loading | | | | 6.3.4.13 |
| Vehicular Traffic | N/A | Road Traffic | | | PM | 6.3.4.14 |
| Painting | N/A | Paint | | | VOC | 6.3.4.15 |
| Fire Training | N/A | Fire Training Grounds | | | $NO_X$, CO, PM, & VOC | 6.3.4.16 |
| Vapor Enhanced Recovery System | VER 3 | Extracts liquids & air from groundwater wells to remediate contaminated soils & groundwater | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |
| Vapor Enhanced Recovery System | VER 4 | Extracts liquids & air from groundwater wells to remediate contaminated soils & groundwater. | | $SO_2$[b] | $SO_2$[c], $NO_X$, CO, PM, & VOC | 6.2 & 6.3.4.2 |

[a] PM represents PM, $PM_{10}$, and $PM_{2.5}$

[b] Continuous monitoring of fuel gas $H_2S$ content to determine the amount of $SO_2$ resulting from the combustion of $H_2S$. Where commercial grade propane with a product specification for sulfur content of 30 ppmv, 30 ppmv will be assumed.

[c] Routine sampling of sulfur content (*i.e.*, sulfur compounds) in fuel gas and/or oil to determine contribution of various sulfur compounds to the total $SO_2$ emissions.

## 6.1 CEMS-MONITORED FACILITIES/POLLUTANTS

This section describes the proposed monitoring and PAL compliance calculation procedures for units equipped with CEMS. Emissions units equipped with CEMS include combustion units (*i.e.*, FCCU, heaters, sulfur recovery plant incinerators, gas turbines, and flares) equipped with $SO_2$, $NO_X$, CO, and/or TRS[16] CEMS as identified in Table 6-1.

### 6.1.1 Monitoring

Consistent with the requirements of 40 CFR 52.21(aa)(12)(iv), CEMS used to monitor PAL pollutant emissions at the facility will be complying with the applicable performance specifications in 40 CFR Part 60, Appendix B and, will sample, analyze, and record data at least every 15 minutes while the unit is in operation. Additionally, CEMS used to monitor PAL pollutant emissions will meet the requirements of STX-TV-003-10, as applicable. Limetree Bay Terminals and Refining will monitor operating data (*e.g.*, fuel usage, fuel heat content, exhaust gas flow, etc.) required to determine compliance with the limit for each PAL pollutant. Operating data will be monitored and recorded on at least a monthly basis.

### 6.1.2 Calculation Procedures

For CEMS-monitored PAL pollutants, pound-per-hour ("lb/hr") emission rates will be calculated from more frequent measurements made by the CEMS in conjunction with operating data (*e.g.*, fuel usage, fuel heat content, exhaust gas flow, etc.). Hourly emissions data will be summed to monthly totals, from which the 12-month rolling total tons/year emissions will be calculated.

## 6.2 CONTINUOUS PARAMETER AND PARAMETRIC EMISSIONS MONITORED FACILITIES/POLLUTANTS

This section describes the proposed monitoring and PAL compliance calculation procedures for units equipped with CPMS/PEMS. Emissions units equipped with CPMS/PEMS include combustion units (*i.e.*, Heaters, boilers, sulfur recovery plant incinerators, gas turbines, and reciprocating engines) which combust refinery fuel gas that is monitored to determine the $H_2S$ content of the fuel such that the contribution of $H_2S$ to the total $SO_2$ emissions can be determined as identified in Table 6-1.

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[16] TRS monitors will be used as surrogate for $SO_2$ monitors.

### 6.2.1 Monitoring

Consistent with the requirements of 40 CFR 52.21(aa)(12)(v), a CPMS or PEMS used to monitor PAL pollutant emissions ate the facility will be based on the current site-specific data demonstrating a correlation between the monitored parameter(s) and the PAL pollutant emissions across the range of operation of the emissions unit and will be sampled, analyzed, and recorded at least every 15 minutes. If a less frequent interval is used it will require Administrator approval. The corresponding operating data will be monitored (*e.g.,* fuel usage, fuel heat content, exhaust gas flow, etc.) to determine compliance with the limit for each PAL pollutant. Operating data will be monitored and recorded on at least a monthly basis.

### 6.2.2 Calculation Procedures

For CPMS/PEMS-monitored PAL pollutants, lb/hr emission rates will be calculated from more frequent measurements made by the CPMS or PEMS in conjunction with corresponding operating data (*e.g.,* fuel usage, fuel heat content, exhaust gas flow, etc.). Hourly emissions data will be summed to monthly totals, from which the 12-month rolling total tons/year emissions will be calculated.

## 6.3 EMISSION FACTOR EMISSIONS UNITS/POLLUTANTS

### 6.3.1 Monitoring

Where an emission factor approach is proposed to monitor PAL pollutant emissions, Limetree Bay Terminals and Refining will use the best available emission factor based on stack test data, vendor information, design/engineering calculations, or Department-approved references (*e.g.,* EPA AP-42) in conjunction with operating data (*e.g.,* fuel usage, heater fired duty). Operating data will be monitored and recorded on at least a monthly basis. Additional PAL requirements related to emission factor calculations are discussed in Section 6.3.3.

### 6.3.2 Calculation Procedures

For emission factor-monitored PAL emission units/pollutants, monthly emission rates will be calculated by applying the applicable emission factor to the appropriate operating data. The emissions data will be summed to compute the monthly totals (tons/month). The 12-month rolling total emissions in TPY will be calculated monthly as the sum of the monthly emissions for the current month and the previous 11 consecutive months. For this and all other proposed calculation procedures, for each month during the first 11 months from the PAL effective date, Limetree Bay Terminals and Refining will calculate the sum of the preceding monthly emissions from the PAL effective date for each emissions unit under the PAL.

### 6.3.3 Additional Requirements for Emission Factor Monitoring

In accordance with 40 CFR 52.21(aa)(12)(vi), an owner or operator using emission factors to monitor PAL pollutant emissions shall meet the following requirements:

*(a)* *All emission factors shall be adjusted, if appropriate, to account for the degree of uncertainty or limitations in the factors' development;*
*(b)* *The emissions unit shall operate within the designated range of use for the emission factor, if applicable; and*
*(c)* *If technically practicable, the owner or operator of a significant emissions unit that relies on an emission factor to calculate PAL pollutant emissions shall conduct validation testing to determine a site-specific emission factor within 6 months of PAL permit issuance, unless the Administrator determines that testing is not required.*

#### 6.3.3.1 Emission Factor Adjustment

The emission factors proposed for PAL monitoring are based on best available data, including stack test data, vendor supplied data, Department-accepted literature references, and/or engineering calculations approved under prior NSR permit actions. All emission factors are based on sound science and meet generally acceptable scientific procedures for data quality and manipulation.

Based on the foregoing, Limetree Bay Terminals and Refining does not believe that any adjustments to emission factors proposed to monitor PAL pollutants are appropriate.

#### 6.3.3.2 Emissions Unit Operation within Designated Range

None of the proposed PAL monitoring emission factors were determined to have a specific designated range of emissions unit operation. All of the PAL emissions units proposed to be monitored using an emission factor approach will operate within the valid range of the emission factor.

#### 6.3.3.3 Validation Testing

Emission factors are based on either site-specific source tests, vendor data, or a reliable literature basis. Limetree Bay Terminals and Refining does not believe that any validation testing, beyond currently required periodic testing, should be required for the emissions units proposed to be monitored using an emission factor approach; Limetree Bay Terminals and Refining requests that the PAL permit not include any validation testing requirements beyond what is currently required.

### 6.3.4 Emissions Factor Monitoring/Calculation Procedure by Unit Category

This section describes the proposed monitoring and PAL compliance calculation procedures for a subset of emission units/pollutants for which an emissions factor approach is proposed for PAL pollutant monitoring.[17] As identified in Table 6-1, an emission factor approach is proposed for the following emissions units for the indicated PAL pollutants:

- FCCU WGS – $PM/PM_{10}/PM_{2.5}$ and VOC
- Heaters, Boilers, Gas Turbines, and Reciprocating Engines – $SO_2$, $NO_X$, CO, $PM/PM_{10}/PM_{2.5}$, and VOC
- Sulfur Recovery Plants – $NO_X$, CO, $PM/PM_{10}/PM_{2.5}$, and VOC
- Flares – $SO_2$, $NO_X$, CO, $PM/PM_{10}/PM_{2.5}$, and VOC
- Tanks – VOC
- Delayed Coker Steam Vent – CO, $PM/PM_{10}/PM_{2.5}$, and VOC
- Platformer Vents – $SO_2$, CO, and VOC
- Sulfuric Acid Plant – $SO_2$, $NO_X$, CO, $PM/PM_{10}/PM_{2.5}$, and VOC
- Process Fugitives – VOC
- Wastewater Treatment – VOC
- Loading Rack – VOC
- Marine Loading – VOC
- Material Handling – $PM/PM_{10}/PM_{2.5}$
- Road Traffic – $PM/PM_{10}/PM_{2.5}$
- Painting – VOC
- Fire Training – $NO_X$, PM, and VOC

#### 6.3.4.1 FCCU

This section describes the proposed monitoring and PAL compliance calculation procedures for FCCU $PM/PM_{10}/PM_{2.5}$ and VOC emissions as identified in Table 6-1.

Monitoring: Feed rate to the FCCU, updates to the emissions testing used to determine flow and emission factors, and other variable parameters needed to calculate emissions per the procedure described below will be monitored on a monthly or more frequent basis.

Calculation Procedure: The $PM/PM_{10}/PM_{2.5}$ and VOC emissions from the FCCU will be calculated based on the most recent stack test based correlation of FCCU feed rate to exhaust gas

[17] Note that as identified in Table 6-1, other proposed monitoring approaches also employ an emission factor general approach but those approaches are sufficiently unique to warrant a separate description.

volume and most current stack test based concentration for particulate matter (*e.g.*, $PM/PM_{10}/PM_{2.5}$) and VOC emissions from the FCCU. The 12-month rolling total VOC emissions in tons/year will be calculated monthly as the sum of the monthly emissions for the previous 12 consecutive months.

#### 6.3.4.2 Heaters, Boilers, Gas Turbines, and Reciprocating Engines

This section describes the proposed monitoring and PAL compliance calculation procedures for heater, boiler, gas turbine, and reciprocating engine $SO_2$, $NO_X$, CO, $PM/PM_{10}/PM_{2.5}$, and VOC emissions as identified in Table 6-1.

<u>Monitoring</u>: Fuel flow rate and fuel heat content will be monitored to determine the heat input rate to the heaters, boilers, gas turbines, and reciprocating engines. On a unit-by-unit basis the heat input-based emission factors used to calculate emissions per the procedures described below will be monitored on a monthly or more frequent basis.

<u>Calculation Procedure</u>: The $SO_2$, $NO_X$, CO, $PM/PM_{10}/PM_{2.5}$, and VOC emissions from the heaters, boilers, gas turbines, and reciprocating engines will be calculated monthly based on the heat input rate and the applicable unit/pollutant emissions factor. Fuel flow rate and heat content data will be used to determine a given unit's heat input rate. The emissions factors used will be based on the best, most current data available (*i.e.*, stack test data, vendor supplied data, or AP-42) and be the most representative of a given unit's operation. The 12-month rolling total in tons/year will be calculated monthly as the sum of the monthly emissions for the previous 12 consecutive months.

#### 6.3.4.3 Sulfur Recovery Plants

This section describes the proposed monitoring and PAL compliance calculation procedures for the Sulfur Recovery Plant $NO_X$, CO, $PM/PM_{10}/PM_{2.5}$, and VOC emissions as identified in Table 6-1. As noted in Section 4.3.3, the SRPs are composed of Claus Sulfur Recovery units, Beavon Units, SRP incinerators (thermal oxidizers), sulfur pits, and Beavon Cooling Towers. The Beavon Units are primarily a source of reduced sulfur compounds and small amounts of combustion related pollutants. The SRP incinerators are used to convert reduced sulfur compounds to $SO_2$. As a result, these units are a source of $SO_2$ and other combustion related pollutants, $NO_X$, CO, $PM/PM_{10}/PM_{2.5}$, and VOC. The Beavon Cooling towers are a source of $PM/PM_{10}/PM_{2.5}$.

<u>Monitoring</u>: To determine emissions for the Beavon Units and SRP incinerators, fuel flow rate, fuel heat content, and other variable parameters necessary to calculate emissions per the procedures described below will be monitored on a monthly or more frequent basis. To determine emission from the Beavon Cooling towers, the cooling water circulation, total

dissolved solids ("TDS") content of the cooling water, and other variable parameters necessary to calculate emissions per the procedures described below will be monitored on a monthly or more frequent basis.

Calculation Procedure: The $NO_X$, CO, $PM/PM_{10}/PM_{2.5}$, and VOC emissions from the Beavon Units and SRP incinerators will be calculated monthly based on the heat input rate and the applicable unit/pollutant emissions factor. Fuel flow rate and heat content data will be used to determine a given SRP incinerator's heat input rate. The emissions factors used will be based on the best, most current data available (*i.e.*, stack test data, vendor supplied data, or AP-42). The additional emissions due to accidental releases will be added to the emissions factor estimates. The 12-month rolling total in tons/year will be calculated monthly as the sum of the monthly emissions for the previous 12 consecutive months.

The $PM/PM_{10}/PM_{2.5}$ emission rates from cooling towers will be calculated monthly based on cooling water flow (recirculation) rates, the design drift loss factor, and TDS content of the water. The 12-month rolling total emissions in TPY will be calculated monthly as the sum of the monthly emissions for the previous 12 consecutive months.

#### 6.3.4.4 Flares

This section describes the proposed monitoring and PAL compliance calculation procedures for the flare $NO_X$, CO, $PM/PM_{10}/PM_{2.5}$, and VOC emissions as identified in Table 6-1.

Monitoring: Flare gas flowrate and heat content and speciation of the gases flared that are needed to calculate emissions per the procedures described below will be monitored on a monthly or more frequent basis.

Calculation Procedure: The flare flowrate and flare gas heat content will be used to determine the heat input to the flare. The heat input will then be used to determine on a monthly basis the $NO_X$, CO, $PM/PM_{10}/PM_{2.5}$, and VOC emissions using the methodology in AP-42, Fifth Edition, Volume I, Chapter 13.5 dated February 2018 or later.

#### 6.3.4.5 Tanks

This section describes the proposed monitoring and PAL compliance calculation procedures for storage tanks in VOC service as identified in Table 6-1.

Monitoring: Storage tank stocks, throughput rates and other variable parameters necessary to calculate emissions per the procedures described below will be monitored on a monthly or more frequent basis.

Calculation Procedure: The VOC emissions from tanks will be calculated monthly. Tank working and standing losses as well as roof landing and filling losses will be calculated monthly using the methodology in AP-42, Fifth Edition, Volume I, Chapter 7 dated November 2011 or later, “Organic Liquid Storage Tanks." The CO and PM emissions from tanks will be calculated monthly using the procedures in AP-42, Fifth Edition, Volume I, Chapter 11.1**.** The 12-month rolling total VOC, CO, and PM emissions in tons/year will be calculated monthly as the sum of the monthly emissions for the previous 12 consecutive months.

#### 6.3.4.6 Platformer Vents

This section describes the proposed monitoring and PAL compliance calculation procedures for Platformer catalyst regenerator vent.

Monitoring: The utilization of each platformer will be monitored on a monthly or more frequent basis.

Calculation Procedure: The $SO_2$, CO and VOC emissions from each platformer catalyst regenerator vent (*i.e.*, #2 Plat, #3 Plat, and #4) will be determined based on each unit’s design capacity, utilization during the monitored period, and the emissions factors that were used to determine the BAE rates. The $SO_2$ and CO factors were developed using data collected in response to EPA’s information collection request. The VOC BAE rate was determined using an EPA developed emissions factor.[18]

#### 6.3.4.7 Sulfuric Acid Plants

This section describes the proposed monitoring and PAL compliance calculation procedures for sulfuric acid plant which includes the acid plant heaters and process unit stack.

Monitoring: For each of the acid plant heaters the fuel flow rate and fuel heat content will be monitored to determine the heat input rate to the heaters. On a unit-by-unit basis the heat input-based emission factors used to calculate emissions per the procedures described below will be monitored on a monthly or more frequent basis. For the acid plant process vent its hours of operation will be monitored on a monthly or more frequent basis.

Calculation Procedure: The $SO_2$, $NO_X$, CO, $PM/PM_{10}/PM_{2.5}$, and VOC emissions from the heater’s stack will be calculated monthly based on the heat input rate and the applicable unit/pollutant emissions factor. Fuel flow rate and heat content data will be used to determine a given unit’s heat input rate. The emissions factors used will be based on the best, most current

[18] Emissions Estimation Protocol for Petroleum Refineries, Version 3, April 2015, Table 5-6, page 5-19.

data available (*i.e.*, stack test data, vendor supplied data, or AP-42) and be the most representative of a given unit's operation. The 12-month rolling total in tons/year will be calculated monthly as the sum of the monthly emissions for the previous 12 consecutive months. The NOx emissions from the sulfuric acid plant process vent will be determined by applying the monthly hours of operation to the stack-test based emissions rate for that vent.

#### 6.3.4.8 Delayed Coker Steam Vent

This section describes the proposed monitoring and PAL compliance calculation procedures for delayed coker steam vent CO, PM, and VOC emissions as identified in Table 6-1

Monitoring: The number of coke drum cycles and pressure in the drum will be monitored on a monthly or more frequent basis.

Calculation Procedure: The CO, PM, and VOC emissions from the coker steam vent will be calculated monthly using stack test-based emission factors derived from testing of the steam vent emissions. The 12-month rolling total PM and VOC emissions in tons/year will be calculated monthly as the sum of the monthly emissions for the previous 12 consecutive months.

#### 6.3.4.9 Process Fugitives

This section describes the proposed monitoring and PAL compliance calculation procedures for equipment leak fugitive VOC emissions as identified in Table 6-1

Monitoring: The equipment components within each process unit at the facility will be monitored in accordance with the requirements at 40 CFR 60.592.

Calculation Procedure: Fugitive VOC emissions from equipment leak fugitives and compressor seals will be calculated monthly using one of two different methodologies depending on whether the equipment components are monitored or unmonitored.

Fugitive VOC from monitored equipment components will be estimated using the appropriate correlations (*e.g., the Petroleum Industry Leak Rate/Screening Value Correlations*) found in U.S. EPA's *Protocol for Equipment Leak Emission Estimates* and the Modified Trapezoidal method to estimate emissions over time. Fugitive VOC from monitored equipment will be managed using LeakDAS software or equivalent.

Fugitive VOC emissions from unmonitored components will be estimated using the Refinery Average Emission Factors applicable to each component type (*e.g.*, valves in heavy liquid service) as found in EPA's *Protocol for Equipment Leak Emission Estimates*, Table 2-2.

Also, where appropriate, the VOC content of the material in a given process area will be used in the emissions estimate to reflect the fact that not all of the material emitted is VOC (*e.g.*, ethane is not a VOC). The 12-month rolling total emissions in tons/year will be calculated monthly as the sum of the monthly emissions for the previous 12 consecutive months.

#### 6.3.4.10 Wastewater Treatment

This section describes the proposed monitoring and PAL compliance calculation procedures for VOC emissions from the various components that comprise the wastewater treatment plant as presented in Table 6-1.

<u>Monitoring</u>: For wastewater facilities in VOC service (*i.e.*, Oily Water Collection System and Advance Wastewater Treatment System) (see Table 6-1), monitoring data related to the process drains and junction boxes within the oily water collection system (i.e. monthly and quarterly visual inspections of water traps, carbon canisters, pressure relief valves and gas-tight covers, as applicable) and the variable parameter input data for the advance wastewater treatment system that is required by EPA's WATER9 model (*i.e*, stream flows and compositions) will be monitored on a monthly or more frequent basis.

<u>Calculation Procedure</u>: The rate of VOC emissions from the oily water collection system will be determined using the TCEQ Guidance for uncontrolled process drains emissions factor and a 95% control factor, which will be based upon the monitoring data that is collected during the visual inspections.

EPA's WATER9 will be used to estimate fugitive VOC emissions from the facility's advance wastewater treatment plant. The emissions model contains elements that account for the static[19] physical and operational characteristics of the various fugitive VOC emissions sources at the facility. Variable (*i.e.*, non-static) elements such as stream flows and compositions will be input into the static emissions model to determine the monthly fugitive VOC emissions from the relevant facilities. The 12-month rolling total emissions in tons/year from the wastewater facilities will be calculated monthly as the sum of the monthly emissions for the previous 12 consecutive months.

#### 6.3.4.11 Loading Rack

This section describes the proposed monitoring and PAL compliance calculation procedures for truck loading rack and fuel pump VOC emissions as identified in Table 6-1.

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[19] The term static refers to the portions of the model that represent the physical configuration of the system. Physical changes to the wastewater system will require revisions to the static model.

Monitoring: Material specific throughputs will be monitored on a monthly or more frequent basis.

Calculation Procedure: The VOC emissions from truck loading and fuel pump operations will be calculated monthly using the procedures outlined in Chapter 5.2 of EPA's AP-42 regarding "Transportation and Marketing of Petroleum Liquids." Variable parameter inputs include records of material throughput and associated parameter values will be used. The 12-month rolling total emissions in tons/year will be calculated monthly as the sum of the monthly emissions for the previous 12 consecutive months.

#### 6.3.4.12 Marine Loading

This section describes the proposed monitoring and PAL compliance calculation procedures for marine loading VOC emissions as identified in Table 6-1.

Monitoring: Material throughput and conditions will be monitored on a monthly or more frequent basis.

Calculation Procedure: The VOC emissions from marine loading operations will be calculated monthly using the procedures outlined in Chapter 5.2 of EPA's AP-42 regarding "Transportation and Marketing of Petroleum Liquids." Variable parameter inputs including records of material throughput and associated typical parameter values and chemical property data (*e.g.*, temperature, vapor pressure, molecular weight) will be used. The 12-month rolling total emissions in tons/year will be calculated monthly as the sum of the monthly emissions for the previous 12 consecutive months.

#### 6.3.4.13 Material Handling

This section describes the proposed monitoring and PAL compliance calculation procedures for east, and west, and dry dock sulfur storage areas, catalyst handling, and coke handling $PM/PM_{10}/PM_{2.5}$ emissions as identified in Table 6-1

Monitoring: Coke, sulfur, catalyst and other solids handling production quantities/throughputs, rates, moisture content, and pile areas (as needed) as well as the wind speed will be monitored on a monthly or more frequent basis.

Calculation Procedure: The $PM/PM_{10}/PM_{2.5}$ emissions from the sulfur storage areas, catalyst handling, and coke handling operations will be calculated monthly using the procedures outlined in AP-42, Fifth Edition, Volume I, Chapter 13, dated November 2006 or later, related to "Aggregate Handling and Storage Piles." Emission factors and control factors from CHEER (Coal Handling Emissions Evaluation Roundtable) Workshop, TNRCC (May 16, 1995) and other appropriate guidance will be applied where appropriate. The 12-month rolling total emissions in tons/year will be calculated monthly as the sum of the monthly emissions for the previous 12 consecutive months.

### 6.3.4.14 Road Traffic

This section describes the proposed monitoring and PAL compliance calculation procedures for road traffic $PM/PM_{10}/PM_{2.5}$ emissions as identified in Table 6-1

Monitoring: The vehicle operating data (*i.e.*, number of vehicles in service and typical mileage) within the source will be monitored on a monthly or more frequent basis. Days with more than 0.01 inches of rain will be monitored and recorded.

Calculation Procedure: The $PM/PM_{10}/PM_{2.5}$ emissions from the vehicular traffic will be calculated monthly using the procedures outlined in AP-42, Fifth Edition, Volume I, Chapter 13, dated January 2011 or later, related to "Paved Roads." The 12-month rolling total emissions in tons/year will be calculated monthly as the sum of the monthly emissions for the previous 12 consecutive months.

### 6.3.4.15 Painting

This section describes the proposed monitoring and PAL compliance calculation procedures for painting related VOC emissions as identified in Table 6-1.

Monitoring: Painting related operating data (*i.e.*, container size, number of containers, paint or thinner type, ingredients) will be monitored on a monthly or more frequent basis. Because the determination of painting VOC emission is a mass-based calculation, the monitoring will be performed pursuant to the requirements at 40 CFR 52.21(aa)(12)(iv) as follows:

- Provide a demonstrated means of validating the published content of the PAL pollutant that is contained in or created by all materials used in or at the emissions unit;
- Assume that the emissions unit emits all of the PAL pollutant that is contained in or created by any raw material or fuel used in or at the emissions unit, if it cannot otherwise be accounted for in the process; and
- Where the vendor of a material or fuel, which is used in or at the emissions unit, publishes a range of pollutant content from such material, the owner or operator must use the highest value of the range to calculate the PAL pollutant emissions unless the Administrator determines there is site-specific data or a site-specific monitoring program to support another content within the range.

Calculation Procedure: The VOC emissions from painting performed at the source will be calculated monthly by summing the VOC amounts contained within the paints and thinners that are consumed. The 12-month rolling total emissions in tons/year will be calculated monthly as the sum of the monthly emissions for the previous 12 consecutive months.

#### 6.3.4.16 Fire Training

This section describes the proposed monitoring and PAL compliance calculation procedures for fire training related emissions as identified in Table 6-1.

Monitoring: The amount of fuel (*i.e.*, gasoline, diesel, and propane) combusted and FireFOAM used will be monitored on a monthly or more frequent basis.

Calculation Procedure: The $SO_2$, $NO_X$, CO, PM, and VOC emissions from fire training will be calculated by using the emission factors published in "Calculation Methods for Criteria Air Pollutant Emission Inventories", Brooks Air Force Base, TX, July 1994 The VOC attributable to the quantity of FireFOAM used will be added to the amount of VOC resulting from fuel combustion. The 12-month rolling total emissions in tons/year will be calculated monthly as the sum of the monthly emissions for the previous 12 consecutive months.

## 6.4 ABSENCE OF MONITORING DATA PROCEDURES

The PAL requirements at 40 CFR 52.21(aa)(12)(vii) contain the following provision regarding periods with no monitoring data:

> *A source owner or operator must record and report maximum potential emissions without considering enforceable emission limitations or operational restrictions for an emissions unit during any period of time that there is no monitoring data, unless another method for determining emissions during such periods is specified in the PAL permit.*

Limetree Bay Terminals and Refining requests that the following condition be incorporated into the PAL permit for the facility:

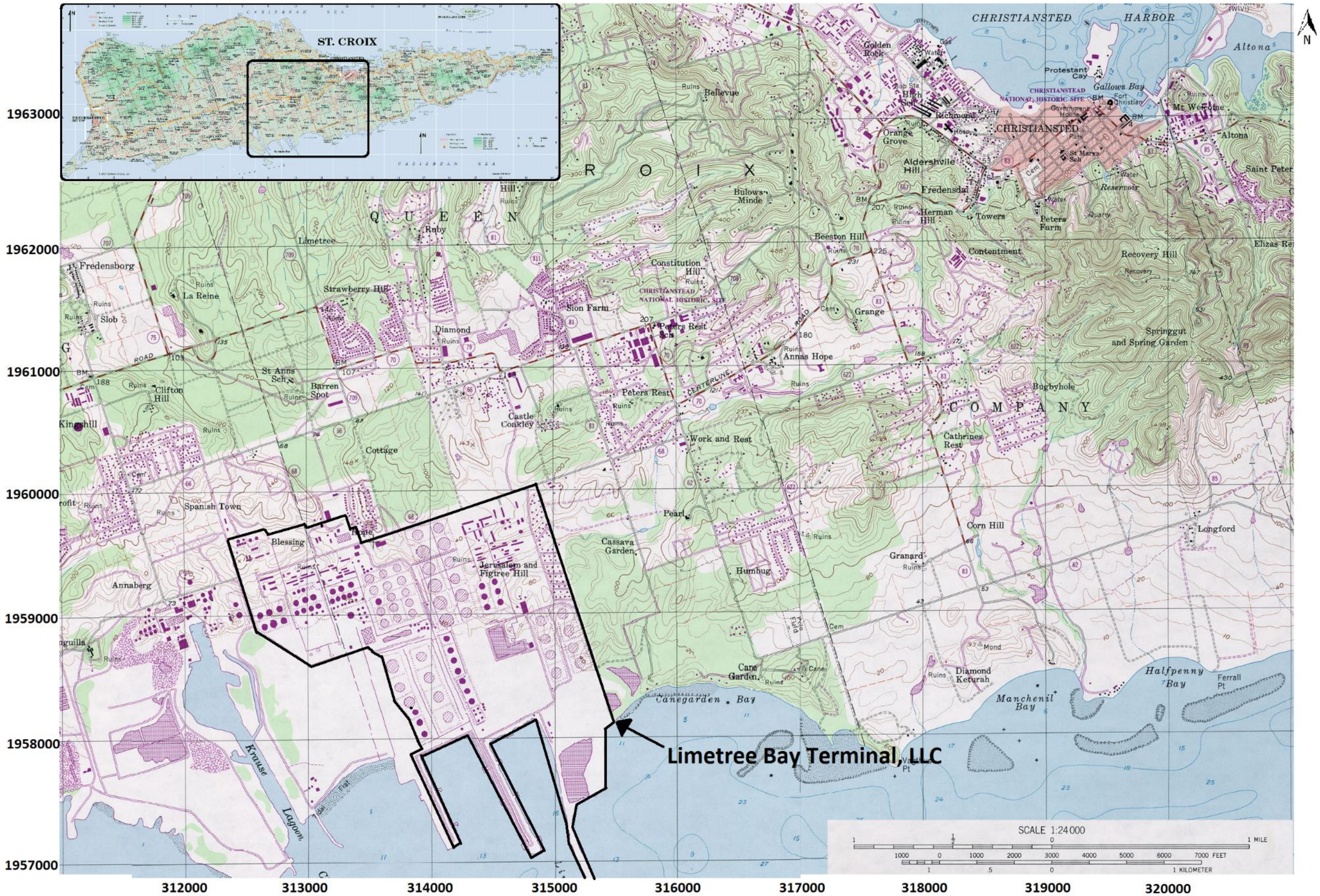
> By [180 days after permit issuance], the permit holder shall develop and maintain a written plan which includes substitution procedures for periods of missing and or inaccurate data used to demonstrate compliance with the proposed PALs, including periods where measuring devices such as flow meters fail calibrations and data is not recorded in the plant data historian. The permit holder shall implement the plan at all times.

## 6.5 PAL PERMIT RECORDKEEPING

Upon issuance of the requested PAL permit, Limetree Bay Terminals and Refining will meet all of the applicable PAL recordkeeping and reporting requirements at 40 CFR 52.21(aa)(13) and (14).

# Appendix A – Figures

**Figure A-1: AREA MAP**




Source: Universal Transverse Mercatur (UTM) Zone 20, Puerto Rican Projection, U.S.G.S.


Figure A-2. Site Plan

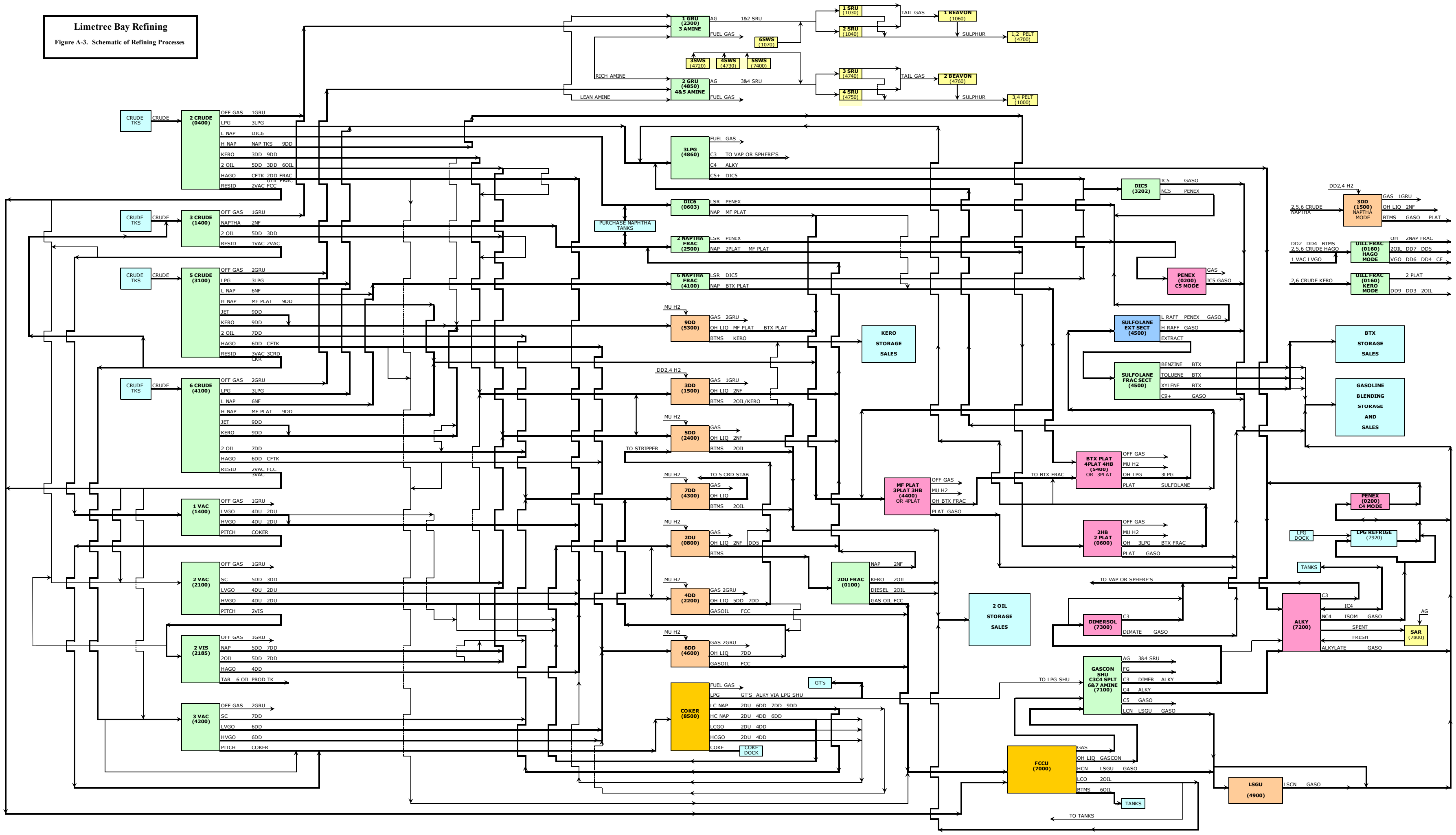



Figure A-3. Process Flow Diagram

# Appendix B

# Potential to Emit Calculations

## Limetree Bay Terminals and Refining
## APPENDIX B - PAL APPLICATION

**Limetree Bay Terminals and Refining**
**Sitewide Annual Potential to Emit**

| Tab | Support Tab | Process Unit | Source Identification (ID) | Unit Description | SO2 | NOx | CO | PM | PM10 | PM2.5 | VOC | H2SO4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B-1 | | FCC Complex | FCCU STK-7051 | FCCU stack | 237 | 213 | 3,235 | 252.9 | 505.9 | 505.9 | 52.7 | |
| B-2 | | #2 DU Fractionator | H-101 | Heater | 137.4 | 229.5 | 52.6 | 14.1 | 14.3 | 10.3 | 3.4 | 6.1 |
| B-2 | | #2 DU Fractionator | H-104 | Heater | 102.1 | 170.5 | 39.1 | 10.5 | 10.6 | 7.6 | 2.6 | 4.6 |
| B-2 | | #2 CDU | H-401A | Charge Heater | 177.7 | 275.2 | 61.5 | 18.2 | 17.9 | 12.7 | 4.0 | 7.9 |
| B-2 | | #2 CDU | H-401B | Charge Heater | 177.7 | 275.2 | 61.5 | 18.2 | 17.9 | 12.7 | 4.0 | 7.9 |
| B-2 | | #2 CDU | H-401C | Charge Heater | 177.7 | 275.2 | 61.5 | 18.2 | 17.9 | 12.7 | 4.0 | 7.9 |
| B-2 | | Penex | H-200 | Charge Heater | 1.2 | 16.0 | 13.4 | 0.3 | 1.2 | 1.2 | 0.9 | 0.1 |
| B-2 | | Penex | H-201 | Fired Reboiler Heater | 1.2 | 16.1 | 13.5 | 0.3 | 1.2 | 1.2 | 0.9 | 0.1 |
| B-2 | | Penex | H-202 | Hot Oil Heater | 4.0 | 146.2 | 43.9 | 1.0 | 4.0 | 4.0 | 2.9 | 0.2 |
| B-2 | | Utility Fractionation | H-160 | Charge Heater | 4.4 | 162.7 | 48.8 | 1.1 | 4.4 | 4.4 | 3.2 | 0.2 |
| B-2 | | #2 Platformer | H-601 | Stripper Reboiler Heater | 1.2 | 15.2 | 12.8 | 0.3 | 1.2 | 1.2 | 0.8 | 0.1 |
| B-2 | | #2 Platformer | H-604 | Platforming No. 2 Interheater | 1.2 | 15.9 | 13.4 | 0.3 | 1.2 | 1.2 | 0.9 | 0.1 |
| B-2 | | #2 Platformer | H-605 | Platforming No. 3 Interheater | 0.5 | 6.6 | 5.6 | 0.1 | 0.5 | 0.5 | 0.4 | 0.0 |
| B-2 | | #2 DU | H-800A | Reactor Charge Heater | 1.4 | 18.4 | 15.4 | 0.3 | 1.4 | 1.4 | 1.0 | 0.1 |
| B-2 | | #2 DU | H-800B | Reactor Charge Heater | 1.4 | 18.4 | 15.4 | 0.3 | 1.4 | 1.4 | 1.0 | 0.1 |
| B-2 | | #2 DU | H-801 | Stripper Heater | 3.3 | 120.8 | 36.3 | 0.8 | 3.3 | 3.3 | 2.4 | 0.2 |
| B-2 | | #4 DD | H-2201A | Reactor Charge Heater | 2.0 | 26.3 | 22.1 | 0.5 | 2.0 | 2.0 | 1.4 | 0.1 |
| B-2 | | #4 DD | H-2201B | Reactor Charge Heater | 2.0 | 26.3 | 22.1 | 0.5 | 2.0 | 2.0 | 1.4 | 0.1 |
| B-2 | | #4 DD | H-2202 | Stripper Reboiler Heater | 3.9 | 143.4 | 43.0 | 1.0 | 3.9 | 3.9 | 2.8 | 0.2 |
| B-2 | | #5 DD | H-2400 | Charge Heater | 1.1 | 14.2 | 11.9 | 0.3 | 1.1 | 1.1 | 0.8 | 0.1 |
| B-3 | | #5 DD | C-2400A | Reciprocating Gas Compressor | 0.02 | 19.4 | 69.4 | 0.3 | 0.6 | 0.6 | 0.9 | 0.0008 |
| B-3 | | #5 DD | C-2400B | Reciprocating Gas Compressor | 0.02 | 19.4 | 69.4 | 0.3 | 0.6 | 0.6 | 0.9 | 0.0008 |
| B-2 | | Naphtha Fractionation | H-2501 | Reboiler Heater | 6.7 | 244.1 | 73.2 | 1.7 | 6.6 | 6.6 | 4.8 | 0.3 |
| B-2 | | #2 Sulfolane | H-4502 | Benzene Column Reboiler Heater | 13.1 | 178.5 | 53.6 | 1.2 | 4.8 | 4.8 | 3.5 | 0.6 |
| B-2 | | #2 Sulfolane | H-4503 | Toluene Column Reboiler Heater | 12.4 | 169.3 | 50.8 | 1.1 | 4.6 | 4.6 | 3.3 | 0.6 |
| B-2 | | #2 Sulfolane | H-4504 | Xylene Column Reboiler Heater | 11.1 | 151.6 | 45.5 | 1.0 | 4.1 | 4.1 | 3.0 | 0.5 |
| B-2 | | #2 Sulfolane | H-4505 | Raffinate Splitter Reboiler Heater | 9.6 | 131.1 | 39.3 | 0.9 | 3.6 | 3.6 | 2.6 | 0.5 |
| B-2 | | #5 CDU | H-3101A | Crude Charge Heater | 352.2 | 590.9 | 137.3 | 34.9 | 35.9 | 26.0 | 9.0 | 15.8 |
| B-2 | | #5 CDU | H-3101B | Crude Charge Heater | 352.2 | 590.9 | 137.3 | 34.9 | 35.9 | 26.0 | 9.0 | 15.8 |
| B-2 | | #6 CDU | H-4101A | Crude Charge Heater | 352.2 | 590.9 | 137.3 | 34.9 | 35.9 | 26.0 | 9.0 | 15.8 |
| B-2 | | #6 CDU | H-4101B | Crude Charge Heater | 352.2 | 590.9 | 137.3 | 34.9 | 35.9 | 26.0 | 9.0 | 15.8 |
| B-2 | | #3 Platformer | H-4401 | Charge Heater | 11.8 | 161.2 | 48.4 | 1.1 | 4.4 | 4.4 | 3.2 | 0.6 |
| B-2 | | #3 Platformer | H-4402 | Fired Reboiler Heater | 11.3 | 153.5 | 46.1 | 1.0 | 4.2 | 4.2 | 3.0 | 0.6 |
| B-2 | | #3 Platformer | H-4451 | Charge Heater | 33.6 | 457.9 | 137.4 | 3.1 | 12.4 | 12.4 | 9.0 | 1.7 |
| B-2 | | #3 Platformer | H-4452 | Intermediate Heater | 21.9 | 298.1 | 89.4 | 2.0 | 8.1 | 8.1 | 5.9 | 1.1 |
| B-2 | | #3 Platformer | H-4453 | Intermediate Heater | 21.9 | 298.1 | 89.4 | 2.0 | 8.1 | 8.1 | 5.9 | 1.1 |
| B-2 | | #3 Platformer | H-4454 | Intermediate Heater | 6.8 | 33.2 | 27.8 | 0.6 | 2.5 | 2.5 | 1.8 | 0.3 |
| B-2 | | #3 Platformer | H-4455 | Fired Reboiler Heater | 12.2 | 166.3 | 49.9 | 1.1 | 4.5 | 4.5 | 3.3 | 0.6 |
| B-2 | | #3 VAC | H-4201 | Prestripper Heater | 349.5 | 440.7 | 91.2 | 34.7 | 32.3 | 22.2 | 6.0 | 15.6 |
| B-2 | | #3 VAC | H-4202 | Vacuum Heater | 338.1 | 426.5 | 88.2 | 33.6 | 31.3 | 21.5 | 5.8 | 15.1 |
| B-2 | | #4 Platformer | H-5401 | Charge Heater | 11.8 | 161.2 | 48.4 | 1.1 | 4.4 | 4.4 | 3.2 | 0.6 |
| B-2 | | #4 Platformer | H-5402 | Fired Reboiler Heater | 11.3 | 153.5 | 46.1 | 1.0 | 4.2 | 4.2 | 3.0 | 0.6 |
| B-2 | | #4 Platformer | H-5451 | Charge Heater | 33.6 | 457.9 | 137.4 | 3.1 | 12.4 | 12.4 | 9.0 | 1.7 |
| B-2 | | #4 Platformer | H-5452 | Intermediate Heater | 21.9 | 298.1 | 89.4 | 2.0 | 8.1 | 8.1 | 5.9 | 1.1 |
| B-2 | | #4 Platformer | H-5453 | Intermediate Heater | 21.9 | 298.1 | 89.4 | 2.0 | 8.1 | 8.1 | 5.9 | 1.1 |
| B-2 | | #4 Platformer | H-5454 | Intermediate Heater | 6.8 | 33.2 | 27.8 | 0.6 | 2.5 | 2.5 | 1.8 | 0.3 |

**Limetree Bay Terminals and Refining**
**Sitewide Annual Potential to Emit**

| Tab | Support Tab | Process Unit | Source Identification (ID) | Unit Description | SO2 | NOx | CO | PM | PM10 | PM2.5 | VOC | H2SO4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B-2 | | #4 Platformer | H-5455 | Fired Reboiler Heater | 12.2 | 166.3 | 49.9 | 1.1 | 4.5 | 4.5 | 3.3 | 0.6 |
| B-2 | | #6 DD | H-4601A | Reactor Charge Heater | 5.4 | 26.3 | 22.1 | 0.5 | 2.0 | 2.0 | 1.4 | 0.3 |
| B-2 | | #6 DD | H-4601B | Reactor Charge Heater | 5.4 | 26.3 | 22.1 | 0.5 | 2.0 | 2.0 | 1.4 | 0.3 |
| B-2 | | #6 DD | H-4602 | Stripper Reboiler Heater | 10.5 | 143.4 | 43.0 | 1.0 | 3.9 | 3.9 | 2.8 | 0.5 |
| B-3 | | #6 DD | C-4601A | Reciprocating Gas Compressor | 0.06 | 428.9 | 58.6 | 0.0 | 1.0 | 1.0 | 12.4 | 0.0030 |
| B-3 | | #6 DD | C-4601B | Reciprocating Gas Compressor | 0.06 | 428.9 | 58.6 | 0.0 | 1.0 | 1.0 | 12.4 | 0.0030 |
| B-3 | | #6 DD | C-4601C | Reciprocating Gas Compressor | 0.06 | 428.9 | 58.6 | 0.0 | 1.0 | 1.0 | 12.4 | 0.0030 |
| B-2 | | #7 DD | H-4301A | Reactor Charge Heater | 5.9 | 28.7 | 24.1 | 0.5 | 2.2 | 2.2 | 1.6 | 0.3 |
| B-2 | | #7 DD | H-4301B | Reactor Charge Heater | 5.9 | 28.7 | 24.1 | 0.5 | 2.2 | 2.2 | 1.6 | 0.3 |
| B-2 | | #7 DD | H-4302 | Stripper Reboiler Heater | 10.8 | 146.8 | 44.0 | 1.0 | 4.0 | 4.0 | 2.9 | 0.5 |
| B-2 | | #9 DD | H-5301A | Reactor Charge Heater | 5.9 | 28.7 | 24.1 | 0.5 | 2.2 | 2.2 | 1.6 | 0.3 |
| B-2 | | #9 DD | H-5301B | Reactor Charge Heater | 5.9 | 28.7 | 24.1 | 0.5 | 2.2 | 2.2 | 1.6 | 0.3 |
| B-2 | | #9 DD | H-5302 | Stripper Reboiler Heater | 10.8 | 146.8 | 44.0 | 1.0 | 4.0 | 4.0 | 2.9 | 0.5 |
| B-2 | B-7 | #1 Beavon | H-1061 (and T-1061) | West SRP Tail Gas Incinerator | - | 4.3 | 291.6 | 0.1 | 0.3 | 0.3 | 36.0 | - |
| B-2 | | #1 SRU Incinerator | H-1032 | Tail Gas Incinerator | 37.4 | 3.1 | 2.6 | 0.1 | 0.2 | 0.2 | 0.2 | 5.7 |
| B-2 | | #2 SRU Incinerator | H-1042 | Tail Gas Incinerator | 78.7 | 6.5 | 5.5 | 0.1 | 0.5 | 0.5 | 0.4 | 12.0 |
| B-2 | B-7 | #2 Beavon | H-4761 (and T-4761) | East Tail Gas Incinerator | - | 4.3 | 388.8 | 0.1 | 0.3 | 0.3 | 48.1 | - |
| B-2 | | #3 SRU & #4 SRU Incinerator | H-4745 | Tail Gas Incinerator | 285.3 | 23.6 | 19.8 | 0.4 | 1.8 | 1.8 | 1.3 | 43.7 |
| B-2 | | LSG Unit | H-4901 | Charge Heater | 4.2 | 2.7 | 15.3 | 3.6 | 3.6 | 3.0 | 4.2 | 0.2 |
| B-2 | | Sulfuric Acid Plant | STK-7801 | Heater Stack | 3.2 | 18.4 | 3.9 | 13.4 | 13.4 | 1.4 | 0.3 | 0.2 |
| B-2 | | Sulfuric Acid Plant | H-7801 | SAP - Process Air Heater | | | | | | | | |
| | | Sulfuric Acid Plant | H-7802 | SAP Converter Heater | | | | | | | | |
| | | Sulfuric Acid Plant | R-7801 | SAP Startup Heater | | | | | | | | |
| B-2 | B-15 | Delayed Coker Unit | H-8501A | Coker process heater 1 | 10.1 | 60.1 | 25.8 | 6.6 | 2.6 | 2.6 | 4.4 | 0.5 |
| B-2 | B-15 | Delayed Coker | H-8501B | Coker process heater | 10.1 | 60.1 | 25.8 | 6.6 | 2.6 | 2.6 | 4.4 | 0.5 |
| B-3 | | #3 DD | C-1500A | Reciprocating Gas Compressor | 0.01 | 52.8 | 0.7 | 0.1 | 0.3 | 0.3 | 0.4 | 0.0004 |
| B-3 | | #3 DD | C-1500B | Reciprocating Gas Compressor | 0.01 | 52.8 | 0.7 | 0.1 | 0.3 | 0.3 | 0.4 | 0.0004 |
| B-3 | | #3 DD | C-1500C | Reciprocating Gas Compressor | 0.01 | 52.8 | 0.7 | 0.1 | 0.3 | 0.3 | 0.4 | 0.0004 |
| B-3 | | Penex | C-200A | Reciprocating Gas Compressor | 0.02 | 33.1 | 272.1 | 0.4 | 0.7 | 0.7 | 1.1 | 0.0011 |
| B-3 | | Penex | C-200B | Reciprocating Gas Compressor | 0.02 | 33.1 | 272.1 | 0.4 | 0.7 | 0.7 | 1.1 | 0.0011 |
| B-3 | | Penex | C-200C | Reciprocating Gas Compressor | 0.02 | 33.1 | 272.1 | 0.4 | 0.7 | 0.7 | 1.1 | 0.0011 |
| B-4 | | Utility II | #5 Boiler (B-1155) | Boiler; Produces Steam | 431.9 | 548.7 | 194.5 | 42.8 | 45.9 | 34.0 | 12.7 | 19.4 |
| B-4 | | Utility III | #6 Boiler (B-3301) | Boiler; Produces Steam | 303.4 | 428.7 | 92.5 | 30.8 | 29.5 | 20.7 | 6.1 | 13.5 |
| B-4 | | Utility III | #7 Boiler (B-3302) | Boiler; Produces Steam | 303.4 | 428.7 | 92.5 | 30.8 | 29.5 | 20.7 | 6.1 | 13.5 |
| B-4 | | Utility III | #8 Boiler (B-3303) | Boiler; Produces Steam | 590.9 | 559.7 | 184.6 | 60.1 | 57.9 | 40.6 | 12.1 | 26.3 |
| B-4 | | Utility III | #9 Boiler (B-3304) | Boiler; Produces Steam | 590.9 | 559.7 | 184.6 | 60.1 | 57.9 | 40.6 | 12.1 | 26.3 |
| B-4 | | Utility III | #10 Boiler (B-3701) | Boiler; Produces Steam | 9.2 | 69.0 | 69.0 | 3.1 | 3.1 | 3.1 | 4.8 | 0.5 |
| B-5 | | Powerhouse 2 | GT No. 4 (G-3404) | Turbine; Produces Electricity | 191.3 | 818.8 | 113.9 | 4.8 | 14.0 | 14.0 | 2.9 | 8.8 |
| B-5 | | Powerhouse 2 | GT No. 5 (G-3405) | Turbine; Produces Electricity | 191.3 | 818.8 | 113.9 | 4.8 | 14.0 | 14.0 | 2.9 | 8.8 |
| B-5 | | Powerhouse 2 | GT No. 7 (G-3407) | Turbine; Produces Electricity | 100.6 | 817.4 | 113.9 | 4.8 | 14.0 | 14.0 | 2.9 | 8.8 |
| B-5 | | Powerhouse 2 | GT No. 8 (G-3408) | Turbine; Produces Electricity | 125.1 | 1,091.1 | 141.6 | 6.0 | 17.4 | 17.4 | 3.6 | 10.9 |
| B-5 | | Powerhouse 2 | GT No. 9 (G-3409) | Turbine; Produces Electricity | 89.3 | 150.2 | 44.1 | 4.4 | 28.7 | 28.7 | 2.8 | 8.2 |
| B-5 | | Powerhouse 2 | GT No. 10 (G-3410) | Turbine; Produces Electricity | 54.6 | 150.2 | 44.1 | 3.0 | 14.0 | 14.0 | 3.0 | 7.0 |
| B-5 | | GT No. 13 and | GT No. 13 (G-3413) | Turbine; Produces Electricity | 39.4 | 165.3 | 196.0 | 97.3 | 111.2 | 111.2 | 10.1 | 72.0 |
| | | GT No. 13 Duct Burner | H-3413 | Duct Burner | | | | | | | | |

**Limetree Bay Terminals and Refining**
**Sitewide Annual Potential to Emit**

| Tab | Support Tab | Process Unit | Source Identification (ID) | Unit Description | SO2 | NOx | CO | PM | PM10 | PM2.5 | VOC | H2SO4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B-6 | | Seawater and Desalination Water Pumps | PD-1602 | Seawater intake pump | 13.9 | 2.1 | 0.5 | 0.2 | 0.2 | 0.2 | 0.2 | 2.1 |
| B-6 | | Seawater and Desalination Water Pumps | PD-1603 | Seawater intake pump | 13.9 | 2.1 | 0.5 | 0.2 | 0.2 | 0.2 | 0.2 | 2.1 |
| B-6 | | Seawater and Desalination Water Pumps | PD-1604 | Seawater intake pump | 13.9 | 2.1 | 0.5 | 0.2 | 0.2 | 0.2 | 0.2 | 2.1 |
| B-6 | | Seawater and Desalination Water Pumps | PD-1605 | Seawater intake pump | 13.9 | 2.1 | 0.5 | 0.2 | 0.2 | 0.2 | 0.2 | 2.1 |
| B-6 | | Seawater and Desalination Water Pumps | PD-1620 | Seawater intake pump | 9.3 | 1.4 | 0.3 | 0.1 | 0.1 | 0.1 | 0.1 | 1.4 |
| B-8 | | #1 SRU | Unit No. 1030 | Sulfur Recovery Units - Sulfur Pits | | | | 0.02 | 0.02 | 0.02 | | |
| B-8 | | #2 SRU | Unit No. 1040 | Sulfur Recovery Units - Sulfur Pits | | | | | | | | |
| B-8 | | #3 SRU | Unit No. 4740 | Sulfur Recovery Units - Sulfur Pits | | | | 0.01 | 0.01 | 0.01 | | |
| B-8 | | #4 SRU | Unit No. 4750 | Sulfur Recovery Units - Sulfur Pits | | | | 0.02 | 0.02 | 0.02 | | |
| B-9 | | #1 Beavon | Beavon CT #1 | Beavon CT #1 | | | | 187.5 | 0.4 | | | |
| B-9 | | #2 Beavon | Beavon CT #2 | Beavon CT #2 | | | | 191.8 | 0.4 | | | |
| B-10 | | West-side Refinery Flare System | #2 Flare (H-1105) | H-1105 - Gas burner | 2,230 | 643 | 2,685 | 18 | 70 | 70 | 7,652 | |
| | | | #3 Flare (H-1104) | H-1104 – Gas burner | | | | | | | | |
| B-10 | | East-side Refinery Flare System | #5 Flare (H-3351) | H-3351 - Gas burner | 4,252 | 1,328 | 5,585 | 36 | 146 | 146 | 19,695 | |
| | | | #6 Flare (H-3352) | H-3352 - Gas burner | | | | | | | | |
| | | | #7 Flare (H-3301) | N-3301 - Gas burner | | | | | | | | |
| B-10 | | FCC/Coker Refinery Flare System | FCC Flare (L.P. Flare - STK 7941) | Gas burner, steam assisted | 1,481 | 427 | 1,794 | 12 | 47 | 47 | 7,323 | |
| | | | Ground Flare (H.P. Flare - STK 7942) | Gas burner | | | | | | | | |
| B-10 | | Tank 7921 Flare System | LPG Flare (STK 7921) | Gas burner, steam assisted | 132.7 | 38.2 | 160.4 | 1.0 | 4.2 | 4.2 | 341.6 | |

**Limetree Bay Terminals and Refining**
**Sitewide Annual Potential to Emit**

| Tab | Support Tab | Process Unit | Source Identification (ID) | Unit Description | SO2 | NOx | CO | PM | PM10 | PM2.5 | VOC | H2SO4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B-11 | | Tank | TK-01PR | INT | | | | | | | 66.4 | |
| B-11 | | Tank | TK-02PR | INT | | | | | | | 66.4 | |
| B-11 | | Tank | TK-03PR | CR | | | | | | | 3.2 | |
| B-11 | | Tank | TK-04PR | CR | | | | | | | 1.5 | |
| B-11 | | Tank | TK-05PR | CR | | | | | | | 1.5 | |
| B-11 | | Tank | TK-06PR | CR | | | | | | | 1.5 | |
| B-11 | | Tank | TK-07PR | DR | | | | | | | 1.8 | |
| B-11 | | Tank | TK-0702 | CR | | | | | | | 2.9 | |
| B-11 | | Tank | TK-1061 | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-1062 | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-1063 | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-1064 | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-1065 | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-1066 | FLAT | | | | | | | 0.001 | |
| B-11 | | Tank | TK-1071 | EXT | | | | | | | 12.7 | |
| B-11 | | Tank | TK-1118 | CR | | | | | | | 0.02 | |
| B-11 | | Tank | TK-1151 | CR | | | | | | | 1.4 | |
| B-11 | | Tank | TK-1156 | INT | | | | | | | 0.7 | |
| B-11 | | Tank | TK-1157 | INT | | | | | | | 0.7 | |
| B-11 | | Tank | TK-1201 | CR | | | | | | | 0.04 | |
| B-11 | | Tank | TK-1202 | CR | | | | | | | 0.04 | |
| B-11 | | Tank | TK-1203 | CR | | | | | | | 0.04 | |
| B-11 | | Tank | TK-1204 | HFR | | | | | | | 0.01 | |
| B-11 | | Tank | TK-1205 | HFR | | | | | | | 0.01 | |
| B-11 | | Tank | TK-1206 | FLAT | | | | | | | 0.1 | |
| B-11 | | Tank | TK-1207 | FLAT | | | | | | | 0.1 | |
| B-11 | | Tank | TK-1208 | FR | | | | | | | 0.1 | |
| B-11 | | Tank | TK-1236 | FR | | | | | | | 0.1 | |
| B-11 | | Tank | TK-1301 | HFR | | | | | | | 0.1 | |
| B-11 | | Tank | TK-1302 | DR | | | | | | | 0.3 | |
| B-11 | | Tank | TK-1304 | HFR | | | | | | | 0.01 | |
| B-11 | | Tank | TK-1305 | HFR | | | | | | | 0.01 | |
| B-11 | | Tank | TK-1401 | FR | | | | | | | 0.01 | |
| B-11 | | Tank | TK-1600 | CR | | | | | | | 0.02 | |
| B-11 | | ~~Tank~~ | ~~TK-1621~~ | FR | | | | | | | 0.6 | |
| B-11 | | ~~Tank~~ | ~~TK-1622~~ | FR | | | | | | | 0.6 | |
| B-11 | | Tank | TK-1626 | HFR | | | | | | | 0.1 | |
| B-11 | | Tank | TK-1627 | HFR | | | | | | | 0.1 | |
| B-11 | | Tank | TK-1628 | HFR | | | | | | | 0.1 | |
| B-11 | | Tank | TK-1629 | HFR | | | | | | | 0.1 | |
| B-11 | | Tank | TK-1630 | HFR | | | | | | | 0.1 | |
| B-11 | | Tank | TK-1631 | HFR | | | | | | | 0.1 | |
| B-11 | | Tank | TK-1632 | HFR | | | | | | | 0.05 | |
| B-11 | | Tank | TK-1633 | HFR | | | | | | | 0.05 | |
| B-11 | | Tank | TK-1653 | HFR | | | | | | | 0.1 | |
| B-11 | | Tank | TK-1663 | EXT | | | | | | | 13.0 | |

**Limetree Bay Terminals and Refining**
**Sitewide Annual Potential to Emit**

| Tab | Support Tab | Process Unit | Source Identification (ID) | Unit Description | SO2 | NOx | CO | PM | PM10 | PM2.5 | VOC | H2SO4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B-11 | | Tank | TK-2653 | CR | | | | | | | 0.1 | |
| B-11 | | Tank | TK-2654 | CR | | | | | | | 0.1 | |
| B-11 | | Tank | TK-3201 | FR | | | | | | | 0.02 | |
| B-11 | | Tank | TK-3202 | DR | | | | | | | 0.3 | |
| B-11 | | Tank | TK-3203 | CR | | | | | | | 0.1 | |
| B-11 | | Tank | TK-3204 | FR | | | | | | | 0.005 | |
| B-11 | | Tank | TK-3205 | FR | | | | | | | 0.01 | |
| B-11 | | Tank | TK-3208 | CR | | | | | | | 0.1 | |
| B-11 | | Tank | TK-3209 | HFR | | | | | | | 0.1 | |
| B-11 | | Tank | TK-3301 | CR | | | | | | | 3.7 | |
| B-11 | | Tank | TK-3302 | DR | | | | | | | 7.8 | |
| B-11 | | Tank | TK-3303 | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-3304 | CR | | | | | | | 3.3 | |
| B-11 | | Tank | TK-3305 | CR | | | | | | | 2.9 | |
| B-11 | | Tank | TK-3306 | CR | | | | | | | 0.8 | |
| B-11 | | Tank | TK-3384 | DR | | | | | | | 0.1 | |
| B-11 | | Tank | TK-3385 | DR | | | | | | | 0.1 | |
| B-11 | | Tank | TK-3386 | DR | | | | | | | 0.3 | |
| B-11 | | Tank | TK-4501 | INT | | | | | | | 18.7 | |
| B-11 | | Tank | TK-4502 | CR | | | | | | | 0.6 | |
| B-11 | | Tank | TK-4503 | INT | | | | | | | 1.8 | |
| B-11 | | Tank | TK-4761 | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-4762 | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-4763 | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-4764 | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-4765 | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-6801 | EXT | | | | | | | 101.1 | |
| B-11 | | Tank | TK-6802 | EXT | | | | | | | 101.1 | |
| B-11 | | Tank | TK-6803 | EXT | | | | | | | 101.1 | |
| B-11 | | Tank | TK-6804 | EXT | | | | | | | 114.5 | |
| B-11 | | Tank | TK-6805 | EXT | | | | | | | 109.5 | |
| B-11 | | Tank | TK-6806 | EXT | | | | | | | 114.5 | |
| B-11 | | Tank | TK-6807 | EXT | | | | | | | 105.3 | |
| B-11 | | Tank | TK-6808 | EXT | | | | | | | 101.1 | |
| B-11 | | Tank | TK-6809 | EXT | | | | | | | 114.6 | |
| B-11 | | Tank | TK-6810 | CR | | | | | | | 0.3 | |
| B-11 | | Tank | TK-6811 | CR | | | | | | | 38.9 | |
| B-11 | | Tank | TK-6812 | CR | | | | | | | 38.9 | |
| B-11 | | Tank | TK-6813 | CR | | | | | | | 38.9 | |
| B-11 | | Tank | TK-6814 | EXT | | | | | | | 114.6 | |
| B-11 | | Tank | TK-6815 | EXT | | | | | | | 114.6 | |
| B-11 | | Tank | TK-6816 | EXT | | | | | | | 102.9 | |
| B-11 | | Tank | TK-6817 | CR | | | | | | | 45.3 | |
| B-11 | | Tank | TK-6818 | CR | | | | | | | 45.3 | |
| B-11 | | Tank | TK-6819 | CR | | | | | | | 45.3 | |
| B-11 | | Tank | TK-6820 | CR | | | | | | | 0.4 | |

**Limetree Bay Terminals and Refining**
**Sitewide Annual Potential to Emit**

| Tab | Support Tab | Process Unit | Source Identification (ID) | Unit Description | SO2 | NOx | CO | PM | PM10 | PM2.5 | VOC | H2SO4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B-11 | | Tank | TK-6821 | CR | | | | | | | 7.6 | |
| B-11 | | Tank | TK-6822 | CR | | | | | | | 13.3 | |
| B-11 | | Tank | TK-6823 | CR | | | | | | | 13.3 | |
| B-11 | | Tank | TK-6824 | CR | | | | | | | 18.2 | |
| B-11 | | Tank | TK-6825 | CR | | | | | | | 135.9 | |
| B-11 | | Tank | TK-6831 | INT | | | | | | | 20.3 | |
| B-11 | | Tank | TK-6832 | INT | | | | | | | 18.0 | |
| B-11 | | Tank | TK-6833 | EXT | | | | | | | 32.1 | |
| B-11 | | Tank | TK-6834 | EXT | | | | | | | 32.1 | |
| B-11 | | Tank | TK-6835 | EXT | | | | | | | 29.2 | |
| B-11 | | Tank | TK-6836 | EXT | | | | | | | 38.8 | |
| B-11 | | Tank | TK-6837 | EXT | | | | | | | 35.0 | |
| B-11 | | Tank | TK-6838 | EXT | | | | | | | 73.0 | |
| B-11 | | Tank | TK-6839 | EXT | | | | | | | 72.3 | |
| B-11 | | Tank | TK-6840 | EXT | | | | | | | 65.6 | |
| B-11 | | Tank | TK-6841 | INT | | | | | | | 86.1 | |
| B-11 | | Tank | TK-6842 | EXT | | | | | | | 32.1 | |
| B-11 | | Tank | TK-6843 | INT | | | | | | | 30.5 | |
| B-11 | | Tank | TK-6851 | CR | | | | | | | 1.4 | |
| B-11 | | Tank | TK-6852 | CR | | | | | | | 1.5 | |
| B-11 | | Tank | TK-6853 | CR | | | | | | | 1.4 | |
| B-11 | | Tank | TK-6854 | CR | | | | | | | 1.4 | |
| B-11 | | Tank | TK-6856 | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-6857 | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-6858 | CR | | | | | | | 40.1 | |
| B-11 | | Tank | TK-6859 | CR | | | | | | | 0.7 | |
| B-11 | | Tank | TK-6860 | CR | | | | | | | 0.7 | |
| B-11 | | Tank | TK-6871 | CR | | | | | | | 0.8 | |
| B-11 | | Tank | TK-6872 | CR | | | | | | | 0.8 | |
| B-11 | | Tank | TK-6873 | CR | | | | | | | 1.4 | |
| B-11 | | Tank | TK-6874 | CR | | | | | | | 1.6 | |
| B-11 | | Tank | TK-6875 | CR | | | | | | | 1.4 | |
| B-11 | | Tank | TK-6876 | CR | | | | | | | 1.6 | |
| B-11 | | Tank | TK-6877 | CR | | | | | | | 3.7 | |
| B-11 | | Tank | TK-6880 | CR | | | | | | | 0.6 | |
| B-11 | | Tank | TK-6881 | CR | | | | | | | 3.7 | |
| B-11 | | Tank | TK-6883 | CR | | | | | | | 0.7 | |
| B-11 | | Tank | TK-6884 | INT | | | | | | | 7.0 | |
| B-11 | | Tank | TK-6887 | CR | | | | | | | 0.7 | |
| B-11 | | Tank | TK-6888 | INT | | | | | | | 37.8 | |
| B-11 | | Tank | TK-7051 | CR | | | | | | | 0.01 | |
| B-11 | | Tank | TK-7201 | CR | | | | | | | 0.02 | |
| B-11 | | Tank | TK-7202 | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-7206 | DR | | | | | | | 0.9 | |
| B-11 | | Tank | TK-7207 | DR | | | | | | | 0.9 | |
| B-11 | | Tank | TK-7208 | DR | | | | | | | 0.9 | |

**Limetree Bay Terminals and Refining**
**Sitewide Annual Potential to Emit**

| Tab | Support Tab | Process Unit | Source Identification (ID) | Unit Description | SO2 | NOx | CO | PM | PM10 | PM2.5 | VOC | H2SO4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B-11 | | Tank | TK-7209 | DR | | | | | | | 0.9 | |
| B-11 | | Tank | TK-7210 | DR | | | | | | | 0.9 | |
| B-11 | | Tank | TK-7211 | DR | | | | | | | 0.9 | |
| B-11 | | Tank | TK-7301 | CR | | | | | | | 0.03 | |
| B-11 | | Tank | TK-7302 | CR | | | | | | | 0.01 | |
| B-11 | | Tank | TK-7401 | EXT | | | | | | | 216.7 | |
| B-11 | | Tank | TK-7402 | EXT | | | | | | | 216.7 | |
| B-11 | | Tank | TK-7403 | EXT | | | | | | | 216.7 | |
| B-11 | | Tank | TK-7404 | EXT | | | | | | | 226.1 | |
| B-11 | | Tank | TK-7405 | CR | | | | | | | 161.0 | |
| B-11 | | Tank | TK-7406 | CR | | | | | | | 152.8 | |
| B-11 | | Tank | TK-7407 | EXT | | | | | | | 226.1 | |
| B-11 | | Tank | TK-7408 | EXT | | | | | | | 201.0 | |
| B-11 | | Tank | TK-7409 | EXT | | | | | | | 239.3 | |
| B-11 | | Tank | TK-7410 | EXT | | | | | | | 226.1 | |
| B-11 | | Tank | TK-7411 | CR | | | | | | | 98.5 | |
| B-11 | | Tank | TK-7412 | CR | | | | | | | 98.5 | |
| B-11 | | Tank | TK-7413 | CR | | | | | | | 45.3 | |
| B-11 | | Tank | TK-7414 | CR | | | | | | | 40.1 | |
| B-11 | | Tank | TK-7415 | CR | | | | | | | 74.1 | |
| B-11 | | Tank | TK-7416 | CR | | | | | | | 45.3 | |
| B-11 | | Tank | TK-7417 | INT | | | | | | | 236.0 | |
| B-11 | | Tank | TK-7418 | INT | | | | | | | 236.0 | |
| B-11 | | Tank | TK-7421 | CR | | | | | | | 40.1 | |
| B-11 | | Tank | TK-7422 | CR | | | | | | | 40.1 | |
| B-11 | | Tank | TK-7423 | EXT | | | | | | | 108.4 | |
| B-11 | | Tank | TK-7424 | EXT | | | | | | | 100.0 | |
| B-11 | | Tank | TK-7425 | INT | | | | | | | 222.3 | |
| B-11 | | Tank | TK-7426 | INT | | | | | | | 222.3 | |
| B-11 | | Tank | TK-7427 | CR | | | | | | | 98.5 | |
| B-11 | | Tank | TK-7428 | CR | | | | | | | 87.2 | |
| B-11 | | Tank | TK-7429 | CR | | | | | | | 98.5 | |
| B-11 | | Tank | TK-7430 | CR | | | | | | | 98.5 | |
| B-11 | | Tank | TK-7431 | INT | | | | | | | 12.0 | |
| B-11 | | Tank | TK-7432 | INT | | | | | | | 25.1 | |
| B-11 | | Tank | TK-7433 | INT | | | | | | | 8.4 | |
| B-11 | | Tank | TK-7434 | INT | | | | | | | 8.4 | |
| B-11 | | Tank | TK-7435 | CR | | | | | | | 1.2 | |
| B-11 | | Tank | TK-7436 | CR | | | | | | | 1.2 | |
| B-11 | | Tank | TK-7437 | CR | | | | | | | 1.2 | |
| B-11 | | Tank | TK-7438 | CR | | | | | | | 1.2 | |
| B-11 | | Tank | TK-7439 | CR | | | | | | | 7.6 | |
| B-11 | | Tank | TK-7440 | CR | | | | | | | 7.6 | |
| B-11 | | Tank | TK-7441 | INT | | | | | | | 65.5 | |
| B-11 | | Tank | TK-7443 | EXT | | | | | | | 168.2 | |
| B-11 | | Tank | TK-7444 | EXT | | | | | | | 109.6 | |

**Limetree Bay Terminals and Refining**
**Sitewide Annual Potential to Emit**

| Tab | Support Tab | Process Unit | Source Identification (ID) | Unit Description | SO2 | NOx | CO | PM | PM10 | PM2.5 | VOC | H2SO4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B-11 | | Tank | TK-7445 | EXT | | | | | | | 109.6 | |
| B-11 | | Tank | TK-7446 | CR | | | | | | | 118.0 | |
| B-11 | | Tank | TK-7447 | EXT | | | | | | | 101.6 | |
| B-11 | | Tank | TK-7448 | INT | | | | | | | 134.6 | |
| B-11 | | Tank | TK-7449 | EXT | | | | | | | 109.6 | |
| B-11 | | Tank | TK-7451 | INT | | | | | | | 42.5 | |
| B-11 | | Tank | TK-7452 | INT | | | | | | | 42.5 | |
| B-11 | | Tank | TK-7453 | INT | | | | | | | 42.5 | |
| B-11 | | Tank | TK-7454 | INT | | | | | | | 30.5 | |
| B-11 | | Tank | TK-7455 | EXT | | | | | | | 32.1 | |
| B-11 | | Tank | TK-7456 | EXT | | | | | | | 32.1 | |
| B-11 | | Tank | TK-7501 | CR | | | | | | | 45.3 | |
| B-11 | | Tank | TK-7502 | CR | | | | | | | 45.3 | |
| B-11 | | Tank | TK-7503 | CR | | | | | | | 45.3 | |
| B-11 | | Tank | TK-7504 | CR | | | | | | | 45.3 | |
| B-11 | | Tank | TK-7505 | CR | | | | | | | 98.5 | |
| B-11 | | Tank | TK-7506 | CR | | | | | | | 76.3 | |
| B-11 | | Tank | TK-7507 | EXT | | | | | | | 106.1 | |
| B-11 | | Tank | TK-7508 | EXT | | | | | | | 101.1 | |
| B-11 | | Tank | TK-7509 | EXT | | | | | | | 109.6 | |
| B-11 | | Tank | TK-7510 | EXT | | | | | | | 204.1 | |
| B-11 | | Tank | TK-7511 | EXT | | | | | | | 231.5 | |
| B-11 | | Tank | TK-7512 | EXT | | | | | | | 229.4 | |
| B-11 | | Tank | TK-7513 | EXT | | | | | | | 224.0 | |
| B-11 | | Tank | TK-7514 | EXT | | | | | | | 231.5 | |
| B-11 | | Tank | TK-7515 | EXT | | | | | | | 206.0 | |
| B-11 | | Tank | TK-7516 | EXT | | | | | | | 226.1 | |
| B-11 | | Tank | TK-7517 | EXT | | | | | | | 214.6 | |
| B-11 | | Tank | TK-7521 | INT | | | | | | | 13.0 | |
| B-11 | | Tank | TK-7522 | INT | | | | | | | 13.0 | |
| B-11 | | Tank | TK-7523 | INT | | | | | | | 13.0 | |
| B-11 | | Tank | TK-7524 | INT | | | | | | | 9.2 | |
| B-11 | | Tank | TK-7525 | INT | | | | | | | 9.2 | |
| B-11 | | Tank | TK-7526 | INT | | | | | | | 9.2 | |
| B-11 | | Tank | TK-7528 | INT | | | | | | | 37.1 | |
| B-11 | | Tank | TK-7541 | CR | | | | | | | 0.05 | |
| B-11 | | Tank | TK-7542 | CR | | | | | | | 0.01 | |
| B-11 | | Tank | TK-7571 | CR | | | | | | | 0.03 | |
| B-11 | | Tank | TK-7601 | INT | | | | | | | 138.4 | |
| B-11 | | Tank | TK-7602 | INT | | | | | | | 120.6 | |
| B-11 | | Tank | TK-7603 | INT | | | | | | | 138.4 | |
| B-11 | | Tank | TK-7604 | INT | | | | | | | 148.9 | |
| B-11 | | Tank | TK-7605 | EXT | | | | | | | 166.1 | |
| B-11 | | Tank | TK-7931 | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-7932 | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-7933 | CR | | | | | | | 0.9 | |

**Limetree Bay Terminals and Refining**
**Sitewide Annual Potential to Emit**

| Tab | Support Tab | Process Unit | Source Identification (ID) | Unit Description | SO2 | NOx | CO | PM | PM10 | PM2.5 | VOC | H2SO4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B-11 | | Tank | TK-7934 | CR | | | | | | | 1.1 | |
| B-11 | | Tank | TK-7943 | CR | | | | | | | 0.03 | |
| B-11 | | Tank | TK-7951 | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-7955 | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-7956 | CR | | | | | | | 0.3 | |
| B-11 | | Tank | TK-7966 | CR (with Carbon Canisters) | | | | | | | 2.2 | |
| B-11 | | Tank | TK-7971 | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-7973 | EXT | | | | | | | 34.8 | |
| B-11 | | Tank | TK-7974 | INT | | | | | | | 0.9 | |
| B-11 | | Tank | TK-S-7974 | EXT | | | | | | | 6.8 | |
| B-11 | | Tank | TK-7975 | EXT | | | | | | | 14.6 | |
| B-11 | | Tank | TK-S-7975 | EXT | | | | | | | 5.4 | |
| B-11 | | Tank | TK-7976 | FLAT | | | | | | | 0.01 | |
| B-11 | | Tank | TK-7977 | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-7978A | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-7978B | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-7979A | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-7979B | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-7981 | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-7982 | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-7983 | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-7984 | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-7986 | FLAT (SUMP?) | | | | | | | 0.01 | |
| B-11 | | Tank | TK-7987 | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-7988 | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-8001 | INT | | | | | | | 0.6 | |
| B-11 | | Tank | TK-8002 | INT | | | | | | | 0.6 | |
| B-11 | | Tank | TK-8501 | DR | | | 0.078 | 0.077 | 0.078 | 0.078 | 0.8 | |
| B-11 | | Tank | TK-8502 | OPEN | | | | | | | - | |
| B-11 | | Tank | TK-8503 | DR | | | | | | | 0.1 | |
| B-11 | | Tank | TK-8505 | FLAT | | | | | | | 0.002 | |
| B-11 | | Tank | TK-8508 | HFR | | | | | | | 0.1 | |
| B-11 | | Tank | TK-8511 | CR | | | | | | | 0.1 | |
| B-11 | | Tank | TK-8701 | CR | | | | | | | 0.8 | |
| B-11 | | Tank | UTT1 | CR | | | | | | | 1.5 | |
| B-11 | | Tank | TK-D290 (frmly D1301) | HFR | | | | | | | 0.1 | |
| B-11 | | Tank | TKD-1609 | HFR | | | | | | | 0.1 | |
| B-11 | | Tank | TKD-1610 | HFR | | | | | | | 0.1 | |

**Limetree Bay Terminals and Refining**
**Sitewide Annual Potential to Emit**

| Tab | Support Tab | Process Unit | Source Identification (ID) | Unit Description | SO2 | NOx | CO | PM | PM10 | PM2.5 | VOC | H2SO4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B-12 | | #2 Platformer | #2 Plat Vent | Plat No. 2 Catalyst Regen Vent | 0.3 | | 2.2 | | | | 1.1 | |
| B-12 | | #3 Platformer | #3 Plat Vent | Plat No. 3 Catalyst Regen Vent | 0.6 | | 3.9 | | | | 2.0 | |
| B-12 | | #4 Platformer | #4 Plat Vent | Plat No. 4 Catalyst Regen Vent | 0.6 | | 3.9 | | | | 2.0 | |
| B-13 | | Sulfuric Acid Plant | STK-7802 | SAP - Process Stack | 201 | 53.4 | | | | | | 8.8 |
| B-14 | | Coker Steam Vent | Coker Steam Vent | Delayed Coker Steam Vent | 1.3 | | 0.9 | 14.8 | 14.8 | 14.8 | 62.4 | |
| B-16a | B-16b | Area 1 | 2 CDU | Process Fugitives | | | | | | | 22.5 | |
| B-16a | B-16b | Area 1 | 3 CDU / 1 VAC | Process Fugitives | | | | | | | 22.4 | |
| B-16a | B-16b | Area 3 | 5 CDU | Process Fugitives | | | | | | | 40.1 | |
| B-16a | B-16b | Area 3 | 6 CDU | Process Fugitives | | | | | | | 44.7 | |
| B-16a | B-16b | Area 2 | 2 VAC | Process Fugitives | | | | | | | 13.4 | |
| B-16a | B-16b | Area 4 | 3 VAC | Process Fugitives | | | | | | | 23.3 | |
| B-16a | B-16b | Area 1 | 1 VIS (2 DU FRAC) | Process Fugitives | | | | | | | 19.0 | |
| B-16a | B-16b | Area 2 | 2 VIS | Process Fugitives | | | | | | | 11.4 | |
| B-16a | B-16b | Area 2 | 2 DD | Process Fugitives | | | | | | | 32.3 | |
| B-16a | B-16b | Area 1 | 3 DD | Process Fugitives | | | | | | | 14.5 | |
| B-16a | B-16b | Area 2 | 4 DD | Process Fugitives | | | | | | | 26.1 | |
| B-16a | B-16b | Area 2 | 5 DD | Process Fugitives | | | | | | | 10.1 | |
| B-16a | B-16b | Area 4 | 6 DD | Process Fugitives | | | | | | | 26.7 | |
| B-16a | B-16b | Area 4 | 7 DD | Process Fugitives | | | | | | | 28.8 | |
| B-16a | B-16b | Area 4 | 9 DD | Process Fugitives | | | | | | | 15.5 | |
| B-16a | B-16b | Area 1 | UT. FRAC. | Process Fugitives | | | | | | | 3.2 | |
| B-16a | B-16b | Area 1 | PENEX | Process Fugitives | | | | | | | 22.6 | |
| B-16a | B-16b | Area 2 | 2 PLAT/2 HYDROBON | Process Fugitives | | | | | | | 17.8 | |
| B-16a | B-16b | Area 4 | 3 PLAT / 3 HYDROBON | Process Fugitives | | | | | | | 26.5 | |
| B-16a | B-16b | Area 4 | 4 PLAT / 4 HYDROBON | Process Fugitives | | | | | | | 27.8 | |
| B-16a | B-16b | Area 4 | LSG | Process Fugitives | | | | | | | 23.6 | |
| B-16a | B-16b | Area 3 | 2 SULFOLANE | Process Fugitives | | | | | | | 35.6 | |
| B-16a | B-16b | Area 3 | DISULFIDE | Process Fugitives | | | | | | | 0.3 | |
| B-16a | B-16b | Area 2 | NAP FRAC. | Process Fugitives | | | | | | | 5.8 | |
| B-16a | B-16b | Area 3 | DEISO-HEXANIZER | Process Fugitives | | | | | | | 3.6 | |
| B-16a | B-16b | Area 1 / Area 3 | AMINE (3,4,5 & T-931) | Process Fugitives | | | | | | | 7.6 | |
| B-16a | B-16b | Area 3 / FCC Complex | MEROX | Process Fugitives | | | | | | | 6.6 | |
| B-16a | B-16b | Area 2 / Area 3 | 1&2 GRU/H2 CON | Process Fugitives | | | | | | | 17.8 | |
| B-16a | B-16b | Area 3 | 1&2 LPG TREATER | Process Fugitives | | | | | | | 2.0 | |
| B-16a | B-16b | Area 3 | 3 LPG FRAC | Process Fugitives | | | | | | | 2.0 | |
| B-16a | B-16b | FCC Complex | FCC & GASCON | Process Fugitives | | | | | | | 61.8 | |
| B-16a | B-16b | FCC Complex | DIMERSOL | Process Fugitives | | | | | | | 20.2 | |
| B-16a | B-16b | Area 3 | 6 AMINE & SHU | Process Fugitives | | | | | | | - | |
| B-16a | B-16b | FCC Complex | ALKY & ACID PLANT | Process Fugitives | | | | | | | 33.4 | |
| B-16a | B-16b | FCC Complex | LIGHT ENDS TREAT | Process Fugitives | | | | | | | 15.5 | |
| B-16a | B-16b | FCC Complex | MTBE | Process Fugitives | | | | | | | 12.2 | |
| B-16a | B-16b | FCC Complex | TAME | Process Fugitives | | | | | | | 15.3 | |
| B-16a | B-16b | SELECTIVE HYDRO | SELECTIVE HYDRO | Process Fugitives | | | | | | | 13.8 | |
| B-16a | B-16b | West Sulfur Complex | 1 BEAVON / 1&2 SRU | Process Fugitives | | | | | | | 3.0 | |
| B-16a | B-16b | East Sulfur Complex | 2 BEAVON / 3&4 SRU | Process Fugitives | | | | | | | 2.9 | |

**Limetree Bay Terminals and Refining**
**Sitewide Annual Potential to Emit**

| Tab | Support Tab | Process Unit | Source Identification (ID) | Unit Description | SO2 | NOx | CO | PM | PM10 | PM2.5 | VOC | H2SO4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B-16a | B-16b | East & West Sulfur Complex | SRU | Process Fugitives | | | | | | | - | |
| B-16a | B-16b | East Sulfur Complex | 3 SWS | Process Fugitives | | | | | | | - | |
| B-16a | B-16b | East Sulfur Complex | 4 SWS | Process Fugitives | | | | | | | - | |
| B-16a | B-16b | East Sulfur Complex | 5 SWS | Process Fugitives | | | | | | | - | |
| B-16a | B-16b | 6 SWS | 6 SWS | Process Fugitives | | | | | | | 1.1 | |
| B-16a | B-16b | Coker Complex | DELAYED COKER | Process Fugitives | | | | | | | 66.8 | |
| B-16a | B-16b | Utility II & III | Utilities (Powerhouse and Boilers) | Process Fugitives | | | | | | | 17.4 | |
| B-16a | B-16b | - | EAST FUEL GAS SYSTEM | Process Fugitives | | | | | | | 19.3 | |
| B-16a | B-16b | - | WEST FUEL GAS SYSTEM | Process Fugitives | | | | | | | 19.1 | |
| B-16a | B-16b | Terminal | TERMINAL (OFFSITES/RUNDOWNS/XFERS) | Process Fugitives | | | | | | | 240.9 | |
| B-17 | | Oily Water Collection System | West Refiniery Oily Water | Process Drains and Junction Boxes Fugitives | | | | | | | 15.9 | |
| B-17 | | Oily Water Collection System | East Refinery Oily Water | Process Drains and Junction Boxes Fugitives | | | | | | | 28.3 | |
| B-17 | | Oily Water Collection System | FCC/DCU Oily Water | Process Drains and Junction Boxes Fugitives | | | | | | | 15.6 | |
| B-17 | | Oily Water Collection System | Terminal Oily Water | Process Drains and Junction Boxes Fugitives | | | | | | | 4.1 | |
| B-18 | | Advanced Wastewater Treatment System (AWWTP) | #1 API (Unit No. 1660) | Oil/Water Separator | | | | | | | 1,007 | |
| B-18 | | | #1 WEMCO | Induced Air Floatation Unit | | | | | | | | |
| B-18 | | | #2 API (Unit No. 1661) | Oil/Water Separator | | | | | | | | |
| B-18 | | | #2 WEMCO | Induced Air Floatation Unit | | | | | | | | |
| B-18 | | | West Benzene Stripper (STK-3510) | Air Stripper | | | | | | | | |
| B-18 | | | #3 API (Unit No. 1662) | Oil/Water Separator | | | | | | | | |
| B-18 | | | #3 WEMCO | Induced Air Floatation Unit | | | | | | | | |
| B-18 | | | East Benzene Stripper (STK-3530) | Air Stripper | | | | | | | | |
| B-18 | | | Advanced Waste Water Tretament | Advanced Waste Water Treatment Plant | | | | | | | | |
| B-19 | | Local Sales Rack | Unit No. 1651 | Dispense liquid and gaseous fuel to tank trucks | | | | | | | 6.3 | |
| B-19 | | Fuel pumps | Service Station | Dispense gasoline and diesel | | | | | | | 24.3 | |

**Limetree Bay Terminals and Refining**
**Sitewide Annual Potential to Emit**

| Tab | Support Tab | Process Unit | Source Identification (ID) | Unit Description | SO2 | NOx | CO | PM | PM10 | PM2.5 | VOC | H2SO4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B-20a | B-20b | Marine Loading (Docks 1 thru 9 and Dry Cargo Dock) | Unit No. 1600 | Ship loading and unloading | 0.1 | 1.5 | 2.0 | 0.2 | 0.2 | 0.2 | 2,000 | 0.01 |
| B-21 | | East Sulfur Storage Area | East Sulfur H&S | Sulfur Handling | | | | 1.7 | 1.0 | 0.4 | | |
| B-21 | | West Sulfur Storage Area | West Sulfur H&S | Sulfur Handling | | | | 1.5 | 0.8 | 0.3 | | |
| B-21 | | Storage pile and conveyor | Sulfur Storage, Handling & Shipping | Sulfur Storage | | | | 5.8 | 3.1 | 1.0 | | |
| B-22 | | Coker Complex | Coke handling, storage, and loading system | Transportation and breaking of solid coke between drums and dock | | | | 4.4 | 3.1 | 2.3 | | |
| B-23 | | FCC Catalyst Handling | FCC Catalyst Handling | FCC Catalyst Handling | | | | 0.05 | 0.02 | 0.004 | | |
| B-24 | | Road Dust | Road Dust | Road dust | | | | 20.1 | 4.0 | 1.0 | | |
| B-25 | | Painting | Painting | Painting | | | | | | | 15 | |
| B-26 | | Firefighter Training | Firefighter Training | Firefighter Training | - | 0.1 | 8.9 | 2.0 | 2.0 | 2.0 | 5.1 | |

**Limetree Bay Terminals and Refining**

**B-1 Fluid Catalytic Cracking Unit (STK-7051) Potential to Emit**

**Table 1. FCCU STK-7051 Annual Potential to Emit**

| | | | |
|---|---|---|---|
| Max. annual throughput to the FCCU | 3.2.16.3 | 58,400,000 | bpy |
| Max. daily throughput to the FCCU | 3.2.16.4 | 165,000 | bpd |
| Max. coke burn-off rate | 3.2.16.5 | 115,500 | lb/hr |
| | | | |
| SO2 | 3.2.16.10(a) | 16 | ppmvd @ 0%O2 |
| | 3.2.16.10(d) | 237 | ppmvd @ 0%O2 |
| | | | |
| NOx | 3.2.16.14 | 25 | ppmvd @ 0%O2 |
| | 3.2.16.15 | 266 | tpy |
| | Consent Decree ¶11 | 20 | ppmvd @ 0%O2 (365-day) |
| | Consent Decree ¶11 | 40 | ppmvd @ 0%O2 (7-day) |
| | | 213 | tpy (per CD ppmvd) |
| | | | |
| CO | 3.2.16.16 | 432 | ppmvd @ 7%O2 |
| | 3.2.16.17 | 3,235 | tpy |
| | | | |
| PM | 3.2.16.7 | 0.5 | lb/10^3 lbs coke burn-off |
| | 3.2.16.7 | 252.9 | tpy |
| | | | |
| PM10 | 3.2.16.9 | 1.0 | lb/10^3 lbs coke burn-off |
| | 3.2.16.9 | 505.9 | tpy |
| | | | |
| VOC | 3.2.16.18 | 20.0 | ppmvd @ 7%O2 |
| | 3.2.16.18 | 52.7 | tpy |

Notes:

(1) Per STX-TV-003-10 #3.2.16.23 the FCCU is exempt from CO and VOC limits during startup of the FCCU (starts with the introduction of feed to the reactor and concludes when a stable regenertor combustion temperature of 1280 F is achieved)

**Limetree Bay Terminals and Refining**
**B-2 Heaters Annual Potential to Emit**

| Default Emission Factors | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fuel | Qualifier | Units | NOx | CO | VOC | PM | PM10 | PM2.5 | SO2 | SO3 | H2S | TRS | Lead |
| No. 6 Oil | Units > 100 MMBtu/hr and Low Sulfur | lb/MMBtu | 0.48 | 0.03 | 0.002 | 0.04 | 0.03 | 0.02 | 0.3 | 0.01 | | | 1.01E-05 |
| | Units > 100 MMBtu/hr and High Sulfur | lb/MMBtu | | | | 0.05 | 0.04 | 0.03 | 0.5 | 0.02 | | | |
| Fuel Gas | Units > 100 MMBtu/hr | lb/MMBtu | 0.27 | 0.08 | 0.01 | 0.002 | 0.01 | 0.01 | | | | | 4.9E-07 |
| | Units < 100 MMBtu/hr | lb/MMBtu | 0.10 | | | | | | | | | | |
| | Units any size subject to NSPS J | lb/MMBtu | | | | | | | 0.02 | 0.001 | | | |
| | Units any size subject to NSPS Ja | lb/MMBtu | | | | | | | 0.01 | 0.0003 | | | |
| Propane | - | lb/MMBtu | | | 0.01 | | | 0.01 | | | | | |
| Butane | - | lb/MMBtu | | | 0.01 | | | 0.01 | | | | | |

Notes:
*Refer to "Def. Emission Factors" tab

**Table 1. Heaters Annual Potential to Emit**

| Process Unit | Source Identification (ID) | Source Description | Appendix C to CD SO2 Applicability | Fuels | Max. Design Capacity | | Operating Scenario | | Annual Potential to Emit | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Reduced Fuel | Normal | NOx | CO | VOC | PM | PM10 | PM2.5 | SO2 | H2SO4 | H2S | TRS | Lead |
| | | | | | MMBtu/hr (LHV) | MMBtu/hr (HHV) | MMBtu/hr (HHV) | MMBtu/hr (HHV) | tpy | tpy | tpy | tpy | tpy | tpy | tpy | tpy | tpy | tpy | tpy |
| | | | | | (1) | (2) | (3) | (3) | (4), (5) | (4), (5) | (4), (5) | (4), (5) | (4), (5) | (4), (5) | (4), (5) | (4), (5) | (4), (5) | (4), (5) | (4), (5) |
| #2 DU Fractionator | H-101 | Heater | NSPS Ja | Fuel Gas, Slurry, 6 oil | 133.7 | 145.9 | 58.7 | 54.6 | 229.5 | 52.6 | 3.4 | 14.1 | 14.3 | 10.3 | 137.4 | 6.1 | | | 2.8E-03 |
| | H-104 | Heater | NSPS Ja | Fuel Gas, Slurry, 6 oil | 99.3 | 108.4 | 43.6 | 40.6 | 170.5 | 39.1 | 2.6 | 10.5 | 10.6 | 7.6 | 102.1 | 4.6 | | | 2.1E-03 |
| Utility Fractionation | H-160 | Charge Heater | NSPS Ja | Fuel Gas | 124.0 | 135.3 | | | 162.7 | 48.8 | 3.2 | 1.1 | 4.4 | 4.4 | 4.4 | 0.2 | | | 2.9E-04 |
| Penex | H-200 | Charge Heater | NSPS Ja | Fuel Gas | 34.1 | 37.2 | | | 16.0 | 13.4 | 0.9 | 0.3 | 1.2 | 1.2 | 1.2 | 0.06 | | | 8.0E-05 |
| | H-201 | Fired Reboiler Heater | NSPS Ja | Fuel Gas | 34.3 | 37.4 | | | 16.1 | 13.5 | 0.9 | 0.3 | 1.2 | 1.2 | 1.2 | 0.06 | | | 8.0E-05 |
| | H-202 | Hot Oil Heater | NSPS Ja | Fuel Gas | 111.4 | 121.6 | | | 146.2 | 43.9 | 2.9 | 1.0 | 4.0 | 4.0 | 4.0 | 0.2 | | | 2.6E-04 |
| #2 CDU | H-401A | Charge Heater | NSPS Ja | Fuel Gas, Slurry, 6 oil | 156.2 | 170.5 | 76.2 | 21.6 | 275.2 | 61.5 | 4.0 | 18.2 | 17.9 | 12.7 | 177.7 | 7.9 | | | 3.6E-03 |
| | H-401B | Charge Heater | NSPS Ja | Fuel Gas, Slurry, 6 oil | 156.2 | 170.5 | 76.2 | 21.6 | 275.2 | 61.5 | 4.0 | 18.2 | 17.9 | 12.7 | 177.7 | 7.9 | | | 3.6E-03 |
| | H-401C | Charge Heater | NSPS Ja | Fuel Gas, Slurry, 6 oil | 156.2 | 170.5 | 76.2 | 21.6 | 275.2 | 61.5 | 4.0 | 18.2 | 17.9 | 12.7 | 177.7 | 7.9 | | | 3.6E-03 |
| #2 Platformer | H-601 | Stripper Reboiler Heater | NSPS Ja | Fuel Gas | 32.5 | 35.5 | | | 15.2 | 12.8 | 0.8 | 0.3 | 1.2 | 1.2 | 1.2 | 0.06 | | | 7.6E-05 |
| | H-604 | Platforming No. 2 Interheater | NSPS Ja | Fuel Gas | 34.0 | 37.1 | | | 15.9 | 13.4 | 0.9 | 0.3 | 1.2 | 1.2 | 1.2 | 0.06 | | | 8.0E-05 |
| | H-605 | Platforming No. 3 Interheater | NSPS Ja | Fuel Gas | 14.1 | 15.4 | | | 6.6 | 5.6 | 0.4 | 0.1 | 0.5 | 0.5 | 0.5 | 0.02 | | | 3.3E-05 |
| #2 DU | H-800A | Reactor Charge Heater | NSPS Ja | Fuel Gas | 39.2 | 42.8 | | | 18.4 | 15.4 | 1.0 | 0.3 | 1.4 | 1.4 | 1.4 | 0.1 | | | 9.2E-05 |
| | H-800B | Reactor Charge Heater | NSPS Ja | Fuel Gas | 39.2 | 42.8 | | | 18.4 | 15.4 | 1.0 | 0.3 | 1.4 | 1.4 | 1.4 | 0.1 | | | 9.2E-05 |
| | H-801 | Stripper Heater | NSPS Ja | Fuel Gas | 92.1 | 100.5 | | | 120.8 | 36.3 | 2.4 | 0.8 | 3.3 | 3.3 | 3.3 | 0.2 | | | 2.2E-04 |
| #4 DD | H-2201A | Reactor Charge Heater | NSPS Ja | Fuel Gas | 56.2 | 61.3 | | | 26.3 | 22.1 | 1.4 | 0.5 | 2.0 | 2.0 | 2.0 | 0.1 | | | 1.3E-04 |
| | H-2201B | Reactor Charge Heater | NSPS Ja | Fuel Gas | 56.2 | 61.3 | | | 26.3 | 22.1 | 1.4 | 0.5 | 2.0 | 2.0 | 2.0 | 0.1 | | | 1.3E-04 |
| | H-2202 | Stripper Reboiler Heater | NSPS Ja | Fuel Gas | 109.3 | 119.3 | | | 143.4 | 43.0 | 2.8 | 1.0 | 3.9 | 3.9 | 3.9 | 0.2 | | | 2.6E-04 |
| #5 DD | H-2400 | Charge Heater | NSPS Ja | Fuel Gas | 30.3 | 33.1 | | | 14.2 | 11.9 | 0.8 | 0.3 | 1.1 | 1.1 | 1.1 | 0.05 | | | 7.1E-05 |
| Naphtha Fractionation | H-2501 | Reboiler Heater | NSPS Ja | Fuel Gas | 186.0 | 203.0 | | | 244.1 | 73.2 | 4.8 | 1.7 | 6.6 | 6.6 | 6.7 | 0.3 | | | 4.4E-04 |
| #5 CDU | H-3101A | Crude Charge Heater | NSPS J | Fuel Gas, Slurry, 6 oil | 348.8 | 380.7 | 144.5 | 138.8 | 590.9 | 137.3 | 9.0 | 34.9 | 35.9 | 26.0 | 352.2 | 15.8 | | | 6.9E-03 |
| | H-3101B | Crude Charge Heater | NSPS J | Fuel Gas, Slurry, 6 oil | 348.8 | 380.7 | 144.5 | 138.8 | 590.9 | 137.3 | 9.0 | 34.9 | 35.9 | 26.0 | 352.2 | 15.8 | | | 6.9E-03 |
| #6 CDU | H-4101A | Crude Charge Heater | NSPS J | Fuel Gas, Slurry, 6 oil | 348.8 | 380.7 | 144.5 | 138.8 | 590.9 | 137.3 | 9.0 | 34.9 | 35.9 | 26.0 | 352.2 | 15.8 | | | 6.9E-03 |
| | H-4101B | Crude Charge Heater | NSPS J | Fuel Gas, Slurry, 6 oil | 348.8 | 380.7 | 144.5 | 138.8 | 590.9 | 137.3 | 9.0 | 34.9 | 35.9 | 26.0 | 352.2 | 15.8 | | | 6.9E-03 |
| #3 VAC | H-4201 | Prestripper Heater | NSPS J | Fuel Gas, Slurry, 6 oil | 231.6 | 252.8 | 120.7 | 148.4 | 440.7 | 91.2 | 6.0 | 34.7 | 32.3 | 22.2 | 349.5 | 15.6 | | | 6.8E-03 |
| | H-4202 | Vacuum Heater | NSPS J | Fuel Gas, Slurry, 6 oil | 224.1 | 244.6 | 116.8 | 143.6 | 426.5 | 88.2 | 5.8 | 33.6 | 31.3 | 21.5 | 338.1 | 15.1 | | | 6.5E-03 |
| #7 DD | H-4301A | Reactor Charge Heater | NSPS J | Fuel Gas | 61.2 | 66.8 | | | 28.7 | 24.1 | 1.6 | 0.5 | 2.2 | 2.2 | 5.9 | 0.3 | | | 1.4E-04 |
| | H-4301B | Reactor Charge Heater | NSPS J | Fuel Gas | 61.2 | 66.8 | | | 28.7 | 24.1 | 1.6 | 0.5 | 2.2 | 2.2 | 5.9 | 0.3 | | | 1.4E-04 |
| | H-4302 | Stripper Reboiler Heater | NSPS J | Fuel Gas | 111.9 | 122.1 | | | 146.8 | 44.0 | 2.9 | 1.0 | 4.0 | 4.0 | 10.8 | 0.5 | | | 2.6E-04 |

**Table 1. Heaters Annual Potential to Emit**

| Process Unit | Source Identification (ID) | Source Description | Appendix C to CD SO2 Applicability | Fuels | Max. Design Capacity | | Operating Scenario | | Annual Potential to Emit | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Reduced Fuel | Normal | NOx | CO | VOC | PM | PM10 | PM2.5 | SO2 | H2SO4 | H2S | TRS | Lead |
| | | | | | MMBtu/hr (LHV) | MMBtu/hr (HHV) | MMBtu/hr (HHV) | MMBtu/hr (HHV) | tpy | tpy | tpy | tpy | tpy | tpy | tpy | tpy | tpy | tpy | tpy |
| | | | | | (1) | (2) | (3) | (3) | (4), (5) | (4), (5) | (4), (5) | (4), (5) | (4), (5) | (4), (5) | (4), (5) | (4), (5) | (4), (5) | (4), (5) | (4), (5) |
| #3 Platformer | H-4401 | Charge Heater | NSPS J | Fuel Gas | 122.9 | 134.1 | | | 161.2 | 48.4 | 3.2 | 1.1 | 4.4 | 4.4 | 11.8 | 0.6 | | | 2.9E-04 |
| | H-4402 | Fired Reboiler Heater | NSPS J | Fuel Gas | 117.0 | 127.7 | | | 153.5 | 46.1 | 3.0 | 1.0 | 4.2 | 4.2 | 11.3 | 0.6 | | | 2.7E-04 |
| | H-4451 | Charge Heater | NSPS J | Fuel Gas | 348.9 | 380.8 | | | 457.9 | 137.4 | 9.0 | 3.1 | 12.4 | 12.4 | 33.6 | 1.7 | | | 8.2E-04 |
| | H-4452 | Intermediate Heater | NSPS J | Fuel Gas | 227.1 | 247.9 | | | 298.1 | 89.4 | 5.9 | 2.0 | 8.1 | 8.1 | 21.9 | 1.1 | | | 5.3E-04 |
| | H-4453 | Intermediate Heater | NSPS J | Fuel Gas | 227.1 | 247.9 | | | 298.1 | 89.4 | 5.9 | 2.0 | 8.1 | 8.1 | 21.9 | 1.1 | | | 5.3E-04 |
| | H-4454 | Intermediate Heater | NSPS J | Fuel Gas | 70.7 | 77.2 | | | 33.2 | 27.8 | 1.8 | 0.6 | 2.5 | 2.5 | 6.8 | 0.3 | | | 1.7E-04 |
| | H-4455 | Fired Reboiler Heater | NSPS J | Fuel Gas | 126.7 | 138.3 | | | 166.3 | 49.9 | 3.3 | 1.1 | 4.5 | 4.5 | 12.2 | 0.6 | | | 3.0E-04 |
| #2 Sulfolane | H-4502 | Benzene Column Reboiler Heater | NSPS J | Fuel Gas | 136.1 | 148.5 | | | 178.5 | 53.6 | 3.5 | 1.2 | 4.8 | 4.8 | 13.1 | 0.6 | | | 3.2E-04 |
| | H-4503 | Toluene Column Reboiler Heater | NSPS J | Fuel Gas | 129.0 | 140.8 | | | 169.3 | 50.8 | 3.3 | 1.1 | 4.6 | 4.6 | 12.4 | 0.6 | | | 3.0E-04 |
| | H-4504 | Xylene Column Reboiler Heater | NSPS J | Fuel Gas | 115.5 | 126.1 | | | 151.6 | 45.5 | 3.0 | 1.0 | 4.1 | 4.1 | 11.1 | 0.5 | | | 2.7E-04 |
| | H-4505 | Raffinate Splitter Reboiler Heater | NSPS J | Fuel Gas | 99.9 | 109.0 | | | 131.1 | 39.3 | 2.6 | 0.9 | 3.6 | 3.6 | 9.6 | 0.5 | | | 2.3E-04 |
| #6 DD | H-4601A | Reactor Charge Heater | NSPS J | Fuel Gas | 56.2 | 61.3 | | | 26.3 | 22.1 | 1.4 | 0.5 | 2.0 | 2.0 | 5.4 | 0.3 | | | 1.3E-04 |
| | H-4601B | Reactor Charge Heater | NSPS J | Fuel Gas | 56.2 | 61.3 | | | 26.3 | 22.1 | 1.4 | 0.5 | 2.0 | 2.0 | 5.4 | 0.3 | | | 1.3E-04 |
| | H-4602 | Stripper Reboiler Heater | NSPS J | Fuel Gas | 109.3 | 119.3 | | | 143.4 | 43.0 | 2.8 | 1.0 | 3.9 | 3.9 | 10.5 | 0.5 | | | 2.6E-04 |
| #9 DD | H-5301A | Reactor Charge Heater | NSPS J | Fuel Gas | 61.2 | 66.8 | | | 28.7 | 24.1 | 1.6 | 0.5 | 2.2 | 2.2 | 5.9 | 0.3 | | | 1.4E-04 |
| | H-5301B | Reactor Charge Heater | NSPS J | Fuel Gas | 61.2 | 66.8 | | | 28.7 | 24.1 | 1.6 | 0.5 | 2.2 | 2.2 | 5.9 | 0.3 | | | 1.4E-04 |
| | H-5302 | Stripper Reboiler Heater | NSPS J | Fuel Gas | 111.9 | 122.1 | | | 146.8 | 44.0 | 2.9 | 1.0 | 4.0 | 4.0 | 10.8 | 0.5 | | | 2.6E-04 |
| #4 Platformer | H-5401 | Charge Heater | NSPS J | Fuel Gas | 122.9 | 134.1 | | | 161.2 | 48.4 | 3.2 | 1.1 | 4.4 | 4.4 | 11.8 | 0.6 | | | 2.9E-04 |
| | H-5402 | Fired Reboiler Heater | NSPS J | Fuel Gas | 117.0 | 127.7 | | | 153.5 | 46.1 | 3.0 | 1.0 | 4.2 | 4.2 | 11.3 | 0.6 | | | 2.7E-04 |
| | H-5451 | Charge Heater | NSPS J | Fuel Gas | 348.9 | 380.8 | | | 457.9 | 137.4 | 9.0 | 3.1 | 12.4 | 12.4 | 33.6 | 1.7 | | | 8.2E-04 |
| | H-5452 | Intermediate Heater | NSPS J | Fuel Gas | 227.1 | 247.9 | | | 298.1 | 89.4 | 5.9 | 2.0 | 8.1 | 8.1 | 21.9 | 1.1 | | | 5.3E-04 |
| | H-5453 | Intermediate Heater | NSPS J | Fuel Gas | 227.1 | 247.9 | | | 298.1 | 89.4 | 5.9 | 2.0 | 8.1 | 8.1 | 21.9 | 1.1 | | | 5.3E-04 |
| | H-5454 | Intermediate Heater | NSPS J | Fuel Gas | 70.7 | 77.2 | | | 33.2 | 27.8 | 1.8 | 0.6 | 2.5 | 2.5 | 6.8 | 0.3 | | | 1.7E-04 |
| | H-5455 | Fired Reboiler Heater | NSPS J | Fuel Gas | 126.7 | 138.3 | | | 166.3 | 49.9 | 3.3 | 1.1 | 4.5 | 4.5 | 12.2 | 0.6 | | | 3.0E-04 |
| #1 Beavon | H-1061 (and T-1061) | Sulfur Recovery Units, Tail gas treatment | NSPS Ja | Fuel Gas | 9.2 | 10 | | | 4.3 | 292 | 36 | 0.1 | 0.3 | 0.3 | | | 2.9 | 36.0 | 2.1E-05 |
| #1 SRU | H-1032 | Tail Gas Incinerator | NSPS Ja | Fuel Gas | 6.6 | 7.2 | | | 3.1 | 2.6 | 0.2 | 0.1 | 0.2 | 0.2 | 37.4 | 5.7 | | | 1.5E-05 |
| #2 SRU | H-1042 | Tail Gas Incinerator | NSPS Ja | Fuel Gas | 13.9 | 15.2 | | | 6.5 | 5.5 | 0.4 | 0.1 | 0.5 | 0.5 | 78.7 | 12.0 | | | 3.3E-05 |
| #2 Beavon | H-4761 (and T-4761) | Sulfur Recovery Units, Tail gas treatment | NSPS J | Fuel Gas | 9.2 | 10 | | | 4.3 | 389 | 48 | 0.1 | 0.3 | 0.3 | | | 3.9 | 48.1 | 2.1E-05 |
| #3 & #4 SRU | H-4745 | East Tail Gas Incinerator | NSPS J | Fuel Gas | 50.4 | 55 | | | 23.6 | 19.8 | 1.3 | 0.4 | 1.8 | 1.8 | 285.3 | 43.7 | | | 1.2E-04 |

**Table 1. Heaters Annual Potential to Emit**

| Process Unit | Source Identification (ID) | Source Description | Appendix C to CD SO2 Applicability | Fuels | Max. Design Capacity MMBtu/hr (LHV) | Max. Design Capacity MMBtu/hr (HHV) | Operating Scenario: Reduced Fuel MMBtu/hr (HHV) | Operating Scenario: Normal MMBtu/hr (HHV) | Annual Potential to Emit: NOx tpy | CO tpy | VOC tpy | PM tpy | PM10 tpy | PM2.5 tpy | SO2 tpy | H2SO4 tpy | H2S tpy | TRS tpy | Lead tpy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | (1) | (2) | (3) | (3) | (4), (5) | (4), (5) | (4), (5) | (4), (5) | (4), (5) | (4), (5) | (4), (5) | (4), (5) | (4), (5) | (4), (5) | (4), (5) |
| LSG Unit | H-4901 | Charge Heater | NSPS J | Fuel Gas, LPG | | 87.3 | | | 2.7 | 15.3 | 4.2 | 3.6 | 3.6 | 3.0 | 4.2 | 0.21 | | | 1.9E-04 |
| Sulfuric Acid Plant | H-7801 | Process Heater | NSPS J | Fuel Gas, Propane | | 42 | | | 18.4 | 3.9 | 0.32 | 13.4 | 13.4 | 1.4 | 3.2 | 0.16 | | | 9.0E-05 |
| | H-7802 | Converter Heater | NSPS J | Fuel Gas, Propane | | | | | | | | | | | | | | | |
| | R-7801 | Startup Heater (Decomposition Furnace) | NSPS J | Fuel Gas, Propane | | | | | | | | | | | | | | | |
| Delayed Coker Unit (DCU) | H-8501A | Coker process heater | NSPS J | Fuel Gas, Propane | | 270 | | | 60.1 | 25.8 | 4.4 | 6.6 | 2.6 | 2.6 | 10.1 | 0.5 | | | 6.1E-04 |
| | H-8501B | Coker process heater | NSPS J | Fuel Gas, Propane | | 270 | | | 60.1 | 25.8 | 4.4 | 6.6 | 2.6 | 2.6 | 10.1 | 0.5 | | | 6.1E-04 |
| | | | | | | | | | NOx | CO | VOC | PM | PM10 | PM2.5 | SO2 | H2SO4 | H2S | TRS | Lead |

Notes:

(1) Max. Design Capacity (LHV) based on 1994 PTO values updated to 1995 values. Normal East Flaring Scenario.

(2) Max. Design Capacity (HHV) = Max. Design Capacity (LHV) * HHV/LHV Ratio

Fuel Gas HHV/LHV = 1.091

Fuel Oil HHV/LHV = 1.055

(3) Fuel Oil Firing limited by permit (blue font is a calculated number not a permit limit):

| Process Unit | Heaters | STX-TV-003-10 Condition | Reduced-Fuel Op. Scenario: Fuel Oil (bbl/day) | Reduced-Fuel Op. Scenario: Fuel Oil (bbl/yr) | Reduced-Fuel Op. Scenario: Fuel Oil (MMBtu/hr) | Normal Op. Scenario: Fuel Oil (bbl/day) | Normal Op. Scenario: Fuel Oil (bbl/yr) | Normal Op. Scenario: Fuel Oil (MMBtu/hr) |
|---|---|---|---|---|---|---|---|---|
| #2 DU Fractionator | H-101 & H-104 | §3.2.2.1.2 | 446 | 146,511 | 102.3 | 415 | 136,327 | 95.2 |
| #2 CDU | H-401A, B, C | §3.2.2.1.3 | 996 | 327,186 | 228.5 | 282 | 92,637 | 64.7 |
| #5 CDU | H-3101A, B | §3.2.2.1.8 | 1,260 | 413,910 | 289.1 | 1,210 | 397,485 | 277.6 |
| #6 CDU | H-4101A, B | §3.2.2.1.9 | 1,260 | 413,910 | 289.1 | 1,210 | 397,485 | 277.6 |
| #3 VAC | H-4201, H-4202 | §3.2.2.1.11 | 1,035 | 339,998 | 237.5 | 1,273 | 418,181 | 292.1 |

(a) Barrel-Of-Oil-Equivalent (BOE) per 26 U.S.C. Title 26, Subtitle A, Chapter 1, Subchapter A, Part IV, Subpart D, §45K(d)(5):

MMBtu/BOE = 5.8

MMBtu/BOE (Fuel Oil) = 6.1

(b) Fuel Oil (bbl/yr) = Fuel Oil (bbl/day) * 365 days/yr * 0.9 [per PSD permit]

(c) Fuel Oil (MMBtu/hr) = Fuel Oil (bbl/yr) * MMBtu/BOE (HHV) * 1 yr/8,760 hr

Example: Fuel Oil H-101 & H-104 = 146,511 bbl/yr * 6.1 MMBtu/bbl * 1 yr/8,760 hr = 102.3 MMBtu/hr

Ratioed to each heater designed capacity

Example: Max. Fuel Oil H-101 (Reduced-Fuel Op. Scenario) = 133.7 MMBtu/hr * 1.055 * 102.3 MMBtu/hr / ((133.7 + 99.3) MMBtu/hr * 1.055) = 58.7 MMBtu/hr

Example: Max. Fuel Oil H-101 (Normal Op. Scenario) = 133.7 MMBtu/hr * 1.055 * 95.2 MMBtu/hr / ((133.7 + 99.3) MMBtu/hr * 1.055) = 54.6 MMBtu/hr

(4) Annual Potential to Emit (PTE) for all heaters except the LSG unit heater, the Sulfuric Acid Plant (SAP) heaters and the DCU heaters calculated using default emission factors.

Annual PTE for LSG unit heater (H-4901), Sulfuric Acid Plant heaters (H-7801, H-7802 and R-7801) and the DCU heaters (H-8501A and B) based on permit limits except:

- For LSG heater (H-4901) for VOC, PM2.5 and Lead calculated using default emission factors
- For SAP heaters (H-7801, H-7802 and R-7801) for PM2.5 and Lead calculated using default emission factors
- For DCU heaters (H-8501A and B) for Lead calculated using default emission factors
- For DCU heaters (H-8501A and B) for H2SO4 calculated using actual test data:

H2SO4 = 0.0030 lb/MMBtu per 95% Confidence Level (CL) of August 14-30, 2007 stack test runs by Air-Tech Environmental, LLC. H2SO4 is assumed equivalent to 95% CL of the test results for inorganic condensibles.

Annual PTE for #1 Beavon and #2 Beavon SRU tail gas treatment include contribution of the heaters H-1061 and H-4761 respectively, as well as the emissions from the Beavon stacks T-1061 and T-4761 as calculated in B-7 Beavon Stacks

Annual PTE for the DCU heaters includes contributon from decoking activities. Refer to B-15 Coker Heaters Decoking

(5) PTE (tpy) = Max. Design Capacity (MMBtu/hr) * Emission Factor (lb/MMBtu) * 8760 hr/yr * 1 ton/2,000 lb

- For fuel gas/oil firing units calculated as maximum PTE firing fuel gas 8760 hr/yr or a combination of fuel gas and oil with the fuel distribution in Reduced and Normal operating scenarios as permitted.

Example: NOx PTE H-101 = Max{

H-101 NOx firing fuel gas = 145.9 MMBtu/hr * 0.27 lb/MMBtu * 8,760 hr/yr * 1 ton/2,000 lb = 175.4 tpy,

H-101 NOx firing fuel gas and No. 6 oil in Reduced Fuel Operating Scenario = [(145.9 - 58.7) MMBtu/hr * 0.27 lb/MMBtu + 58.7 MMBtu/hr * 0.48 lb/MMBtu] * 8,760 hr/yr * 1 ton/2,000 lb = 229.5 tpy,

H-101 NOx firing fuel gas and No. 6 oil in Normal Fuel Operating Scenario = [(145.9 - 54.6) MMBtu/hr * 0.27 lb/MMBtu + 54.6 MMBtu/hr * 0.48 lb/MMBtu] * 8,760 hr/yr * 1 ton/2,000 lb = 225.8 tpy,

} = 229.5 tpy

**Limetree Bay Terminals and Refining**
**B-3 Compressors Annual Potential to Emit**

| Fuel | Qualifier | Units | Default Emission Factors* NOx | CO | VOC | PM | PM10 | PM2.5 | SO2 | SO3 |
|---|---|---|---|---|---|---|---|---|---|---|
| LPG | 4SRB, 90 - 105% Load | lb/MMBtu | 2.21 | 3.72 | 2.96E-02 | 9.50E-03 | 1.94E-02 | 1.94E-02 | 5.88E-04 | 2.36E-05 |
| | 4SRB, < 90% Load | lb/MMBtu | 2.27 | 3.51 | | | | | | |
| | 4SLB, 90 - 105% Load | lb/MMBtu | 4.08 | 0.32 | 1.18E-01 | 7.71E-05 | 9.99E-03 | 9.99E-03 | 5.88E-04 | 2.36E-05 |
| | 4SLB, < 90% Load | lb/MMBtu | 0.85 | 0.56 | | | | | | |

Notes:

*Refer to "Def. Emission Factors" tab

**Table 1. Compressors Annual Potential to Emit**

| Process Unit | Source Identification (ID) | Source Description | Rated BHP | Appendix C to CD - SO2 Applicability | Fuels | Engine | Max. Design Capacity MMBtu/hr (LHV) | Max. Design Capacity MMBtu/hr (HHV) | Annual Potential to Emit NOx tpy | CO tpy | VOC tpy | PM tpy | PM10 tpy | PM2.5 tpy | SO2 tpy | H2SO4 tpy |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | (1) | (2) | | | | (3) | (4) | (4) | (4) | (4) | (4) | (4) | (4) | (4) |
| Penex | C-200A | RICE | 880 | NSPS Ja | LPG | 4SRB | 8.1 | 8.8 | 33.1 | 272.1 | 1.1 | 0.4 | 0.7 | 0.7 | 0.02 | 0.001 |
| | C-200B | RICE | 880 | NSPS Ja | LPG | 4SRB | 8.1 | 8.8 | 33.1 | 272.1 | 1.1 | 0.4 | 0.7 | 0.7 | 0.02 | 0.001 |
| | C-200C | RICE | 880 | NSPS Ja | LPG | 4SRB | 8.1 | 8.8 | 33.1 | 272.1 | 1.1 | 0.4 | 0.7 | 0.7 | 0.02 | 0.001 |
| #3 DD | C-1500A | RICE | 330 | NSPS Ja | LPG | 4SRB | 3.0 | 3.3 | 52.8 | 0.7 | 0.4 | 0.1 | 0.3 | 0.3 | 0.01 | 0.0004 |
| | C-1500B | RICE | 330 | NSPS Ja | LPG | 4SRB | 3.0 | 3.3 | 52.8 | 0.7 | 0.4 | 0.1 | 0.3 | 0.3 | 0.01 | 0.0004 |
| | C-1500C | RICE | 330 | NSPS Ja | LPG | 4SRB | 3.0 | 3.3 | 52.8 | 0.7 | 0.4 | 0.1 | 0.3 | 0.3 | 0.01 | 0.0004 |
| #5 DD | C-2400A | RICE | 660 | NSPS Ja | LPG | 4SRB | 6.1 | 6.6 | 19.4 | 69.4 | 0.9 | 0.3 | 0.6 | 0.6 | 0.02 | 0.001 |
| | C-2400B | RICE | 660 | NSPS Ja | LPG | 4SRB | 6.1 | 6.6 | 19.4 | 69.4 | 0.9 | 0.3 | 0.6 | 0.6 | 0.02 | 0.001 |
| #6 DD | C-4601A | RICE | 2,400 | NSPS J | LPG | 4SLB | 22.1 | 24.0 | 428.9 | 58.6 | 12.4 | 0.0 | 1.0 | 1.0 | 0.1 | 0.003 |
| | C-4601B | RICE | 2,400 | NSPS J | LPG | 4SLB | 22.1 | 24.0 | 428.9 | 58.6 | 12.4 | 0.0 | 1.0 | 1.0 | 0.1 | 0.003 |
| | C-4601C | RICE | 2,400 | NSPS J | LPG | 4SLB | 22.1 | 24.0 | 428.9 | 58.6 | 12.4 | 0.0 | 1.0 | 1.0 | 0.1 | 0.003 |

Notes:

(1) Brake horsepower per equipment specifications

(2) NSPS J and Ja sulfur limit for fuel gas combustion is higher than AP-42 default emission factors for LPG

(3) MMBtu/hr (HHV) = Brake HP * Avg. Brake-Specific Fuel Consumption (Btu/hp-hr) * 1 MMBtu/10^6 Btu / Efficiency Factor (%)

Avg. Brake-Specific Fuel Consumption = 7,000 Btu/hp-hr [AP-42, Ch. 3.3]

Efficiency Factor = 70 %

MMBtu/hr (LHV) = Max. Design Capacity (LHV) / Ratio HHV/LHV

LPG HHV/LHV = 1.086

(4) Annual Potential to Emit (PTE) for Penex and #5 DD compressors calculated using permit limits (NOx and CO) and default emission factors (for all other pollutants).

Annual PTE for #3 DD compressors calculated using stack test data (Nox and CO) and default emission factors (for all other pollutants)

Annual PTE for # 6 DD calculated using defualt emission factors

PTE (tpy) = Max. Design Capacity (MMBtu/hr) * Emission Factor (lb/MMBtu) * 8,760 hr/yr * 1 ton/2,000 lb

Example: NOx PTE C-200A = 8.80MMBtu/hr * 0.86 lb/MMBtu * 8,760 hr/yr * 1 ton/2,000 lb = 33.1 tpy

**Limetree Bay Terminals and Refining**
**B-4 Boilers Annual Potential to Emit**

| Default Emission Factors* | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Fuel | Qualifier | Units | NOx | CO | VOC | PM | PM10 | PM2.5 | SO2 | SO3 | Lead |
| No. 6 Oil | Low Sulfur | lb/MMBtu | 0.48 | 0.03 | 0.002 | 0.04 | 0.03 | 0.02 | 0.3 | 0.01 | 1.01E-05 |
| | High Sulfur | lb/MMBtu | | | | 0.05 | 0.04 | 0.03 | 0.5 | 0.02 | |
| Fuel Gas | Units > 100 MMBtu/hr | lb/MMBtu | 0.27 | 0.08 | 0.01 | 0.002 | 0.01 | 0.01 | | | 4.9E-07 |
| | NSPS J | lb/MMBtu | | | | | | | 0.02 | 0.001 | |
| | NSPS Ja | lb/MMBtu | | | | | | | 0.01 | 0.0003 | |
| Propane | - | lb/MMBtu | | | 0.01 | | | 0.01 | | | |
| Gaseous Fuels | NSPS D | lb/MMBtu | 0.20 | | | 0.10 | | | | | |
| Liquid Fuels | NSPS D | lb/MMBtu | 0.30 | | | | | | 0.80 | | |

Notes:
*Refer to "Def. Emission Factors" tab

**Table 1. Boilers Annual Potential to Emit**

| Process Unit | Source Identification (ID) | Source Description | Consent Decree ¶135 (Boiler 10 per permit) | Appendix C to CD SO2 Applicability (Boiler 10 per permit) | Fuels | Max. Design Capacity | | Operating Scenario | | Annual Potential to Emit | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Reduced Fuel | Normal | NOx | CO | VOC | PM | PM10 | PM2.5 | SO2 | H2SO4 | Lead |
| | | | | | | MMBtu/hr (LHV) | MMBtu/hr (HHV) | MMBtu/hr (HHV) | MMBtu/hr (HHV) | tpy | tpy | tpy | tpy | tpy | tpy | tpy | tpy | tpy |
| | | | | | | (1) | (2) | (3) | (3) | (5), (6) | (5), (6) | (5), (6) | (5), (6) | (5), (6) | (5), (6) | (5), (6) | (5), (6) | (5), (6) |
| Utility II | #5 Boiler (B-1155) | #5 Boiler (B-1155) | NSP D | NSPS J | Fuel Gas, 6 oil | 494.0 | 539.2 | 174.4 | 137.9 | 548.7 | 194.5 | 12.7 | 42.8 | 45.9 | 34.0 | 431.9 | 19.4 | 0.01 |
| Utility III | #6 Boiler (B-3301) | #6 Boiler (B-3301) | | NSPS Ja | Fuel Gas, 6 oil | 235.0 | 256.5 | 91.8 | 130.5 | 428.7 | 92.5 | 6.1 | 30.8 | 29.5 | 20.7 | 303.4 | 13.5 | 0.01 |
| Utility III | #7 Boiler (B-3302) | #7 Boiler (B-3302) | | NSPS Ja | Fuel Gas, 6 oil | 235.0 | 256.5 | 91.8 | 130.5 | 428.7 | 92.5 | 6.1 | 30.8 | 29.5 | 20.7 | 303.4 | 13.5 | 0.01 |
| Utility III | #8 Boiler (B-3303) | #8 Boiler (B-3303) | NSP D | NSPS Ja | Fuel Gas, 6 oil | 469.0 | 511.9 | 115.1 | 254.1 | 559.7 | 184.6 | 12.1 | 60.1 | 57.9 | 40.6 | 590.9 | 26.3 | 0.01 |
| Utility III | #9 Boiler (B-3304) | #9 Boiler (B-3304) | NSP D | NSPS Ja | Fuel Gas, 6 oil | 469.0 | 511.9 | 115.1 | 254.1 | 559.7 | 184.6 | 12.1 | 60.1 | 57.9 | 40.6 | 590.9 | 26.3 | 0.01 |
| Utility III | #10 Boiler (B-3701) | #10 Boiler (B-3701) | NSPS Db | NSPS J | Fuel Gas, Propane | 206.1 | 225.0 | | | 69.0 | 69.0 | 4.82 | 3.1 | 3.1 | 3.1 | 9.2 | 0.45 | 4.8E-04 |

Notes:
(1) Max. Design Capacity (LHV) based on 1994 PTO values updated to 1995 values. Normal East Flaring Scenario.
(2) Max. Design Capacity (HHV) = Max. Design Capacity (LHV) * HHV/LHV Ratio
Fuel Gas HHV/LHV = 1.091
Fuel Oil HHV/LHV = 1.055
(4) Fuel Oil Firing limited by permit (blue font is a calculated number not a permit limit):

| Process Unit | Boilers | STX-TV-003-10 Condition | Reduced-Fuel Op. Scenario | | | Normal Op. Scenario | | |
|---|---|---|---|---|---|---|---|---|
| | | | Fuel Oil (bbl/day) | Fuel Oil (bbl/yr) | Fuel Oil (MMBtu/hr) | Fuel Oil (bbl/day) | Fuel Oil (bbl/yr) | Fuel Oil (MMBtu/hr) |
| Utility II | B-1155 | §3.2.1.2.2 | 760 | 249,660 | 174.4 | 592 | 197,472 | 137.9 |
| Utility III | B-3301, B-3302, B-3303, B-3304 | §3.2.1.3.1 | 1,506 | 494,721 | 345.5 | 3,325 | 1,092,263 | 762.9 |
| Utility III | B-3301, B-3302 | §3.2.1.3.2 | 800 | 262,800 | 183.5 | 1,138 | 373,833 | 261.1 |

(a) Barrel-Of-Oil-Equivalent (BOE) per 26 U.S.C. Title 26, Subtitle A, Chapter 1, Subpchapter A, Part IV, Subpart D, §45K(d)(5):
MMBtu/BOE = 5.8
MMBtu/BOE (Fuel Oil) = 6.1
(b) Fuel Oil (bbl/yr) = Fuel Oil (bbl/day) * 365 days/yr * 0.9 [per PSD permit]
(c) Fuel Oil (MMBtu/hr) = Fuel Oil (bbl/yr) * MMBtu/BOE (HHV) * 1 yr/8,760 hr
Example: Fuel Oil B-3301, B-3302 = 262,800 bbl/yr * 6.1 MMBtu/bbl * 1 yr/8,760 hr = 183.5 MMBtu/hr
Ratioed to each boiler designed capacity
Example: Max. Fuel Oil B-3301 (Reduced-Fuel Op. Scenario) = 235.0 MMBtu/hr * 1.055 * 183.5 MMBtu/hr / ((235.0 + 235.0) MMBtu/hr * 1.055) = 91.8 MMBtu/hr
Example: Max. Fuel Oil B-3302 (Reduced-Fuel Op. Scenario) = 235.0 MMBtu/hr * 1.055 * 183.5 MMBtu/hr / ((235.0 + 235.0) MMBtu/hr * 1.055) = 91.8 MMBtu/hr
(5) Annual Potential to Emit (PTE) for all boilers except Boiler #10 (B-3701) calculated using default emission factors.
Annual PTE for Boiler #10 (B-3701) based on permit limits except lead (AP-42)
(6) PTE (tpy) = Max. Design Capacity (MMBtu/hr) * Emission Factor (lb/MMBtu) * 8760 hr/yr * 1 ton/2,000 lb
PTE calculated as maximum emissions firing fuel gas 8760 hr/yr or a combination of fuel gas and oil with the fuel distribution in Reduced and Normal operating scenarios as permitted.
Example: NOx PTE #6 Boiler (B-3301) = Max{
#6 Boiler NOx firing fuel gas = 256.5 MMBtu/hr * 0.27 lb/MMBtu * 8,760 hr/yr * 1 ton/2,000 lb = 308.4 tpy,
#6 Boiler NOx firing fuel gas and No. 6 oil in Reduced Fuel Operating Scenario = [(256.5 - 91.8) MMBtu/hr * 0.27 lb/MMBtu + 91.8 MMBtu/hr * 0.48 lb/MMBtu] * 8,760 hr/yr * 1 ton/2,000 lb = 393.0 tpy
#6 Boiler NOx firing fuel gas and No. 6 oil in Reduced Fuel Operating Scenario = [(256.5 - 130.5) MMBtu/hr * 0.27 lb/MMBtu + 130.5 MMBtu/hr * 0.48 lb/MMBtu] * 8,760 hr/yr * 1 ton/2,000 lb = 428.7 tpy
} = 428.7 tpy

**Limetree Bay Terminals and Refining**
**B-5 Turbines Annual Potential to Emit**

| Default Emission Factors* | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Fuel | Qualifier | Units | NOx | CO | VOC | PM | PM10 | PM2.5 | SO2 | H2SO4 | Lead |
| Fuel Gas / LPG | Uncontrolled, ≥ 80% load | lb/MMBtu | | 0.08 | 0.0021 | 0.002 | 0.007 | 0.007 | | 4.7E-03 | |
| | Steam Injection, ≥ 80% load | lb/MMBtu | | 0.03 | | | | | | | |
| | NSPS J | lb/MMBtu | | | | | | | 0.02 | | |
| Distillate Oil | Uncontrolled, ≥ 80% load | lb/MMBtu | | 0.003 | 4.1E-04 | 0.004 | 0.012 | 0.012 | | 7.2E-03 | 1.4E-05 |
| | Steam Injection, ≥ 80% load | lb/MMBtu | | 0.1 | | | | | | | |
| | Sulfur = 0.2 wt%, ≥ 80% load | lb/MMBtu | | | | | | | 0.20 | | |
| | Sulfur = 0.1 wt%, ≥ 80% load | lb/MMBtu | | | | | | | 0.10 | | |

Notes:
*Refer to "Def. Emission Factors" tab

**Table 1. Turbines Annual Potential to Emit**

| Process Unit | Source Identification (ID) | Source Description | Appendix C to CD - SO2 Applicability | Fuels | Max. Design Capacity | | Operating Scenario | | Annual Potential to Emit | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Reduced Fuel | Normal | NOx | CO | VOC | PM | PM10 | PM2.5 | SO2 | H2SO4 | Lead |
| | | | | | MMBtu/hr (LHV) | MMBtu/hr (HHV) (as Fuel Gas) | MMBtu/hr (HHV) | MMBtu/hr (HHV) | tpy | tpy | tpy | tpy | tpy | tpy | tpy | tpy | tpy |
| | | | | | (1) | (2) | (3), (4) | (3), (4) | | | | | | | | | |
| Power House 2 | GT No. 4 (G-3404) | Gas Turbine GT-4 | NSPS J | Fuel Gas, Propane, Distillate Oil | 290.4 | 317.0 | 205.0 | 199.3 | 818.8 | 113.9 | 2.9 | 4.8 | 14.0 | 14.0 | 191.3 | 8.8 | 0.01 |
| Power House 2 | GT No. 5 (G-3405) | Gas Turbine GT-5 | NSPS J | Fuel Gas, Propane, Distillate Oil | 290.4 | 317.0 | 205.0 | 199.3 | 818.8 | 113.9 | 2.9 | 4.8 | 14.0 | 14.0 | 191.3 | 8.8 | 0.01 |
| Power House 2 | GT No. 7 (G-3407) | Gas Turbine GT-7 | NSPS J | Propane, Distillate Oil | 290.4 | 317.0 | 205.0 | 199.3 | 817.4 | 113.9 | 2.9 | 4.8 | 14.0 | 14.0 | 100.6 | 8.8 | 0.01 |
| Power House 2 | GT No. 8 (G-3408) | Gas Turbine GT-8 | NSPS J | Propane, Distillate Oil | 361.2 | 394.2 | 255.0 | 247.8 | 1,091.1 | 141.6 | 3.6 | 6.0 | 17.4 | 17.4 | 125.1 | 10.9 | 0.02 |
| Power House 2 | GT No. 9 (G-3409) | Gas Turbine GT-9 | NSPS J | Propane, Butane, Distillate Fuel oil | 361.2 | 304.0 | 176.3 | | 150.2 | 44.1 | 2.8 | 4.4 | 28.7 | 28.7 | 89.3 | 8.2 | 0.01 |
| Power House 2 | GT No. 10 (G-3410) | Gas Turbine GT-10 | NSPS J | Propane, Butane, Distillate Fuel oil | | 325.0 | 32.5 | | 150.2 | 44.1 | 3.0 | 3.0 | 14.0 | 14.0 | 54.6 | 7.0 | 2.0E-03 |
| Power House 2 | GT No. 13 (G-3413) | Gas Turbine GT-13 and Duct Burner | | Fuel Gas, LPG, Distillate Oil | | 356.0 | 49.6 | | 165.3 | 196.0 | 10.1 | 97.3 | 111.2 | 111.2 | 39.4 | 72.0 | 0.003 |
| | H-3413 | Gas Turbine GT-13 HRSG Duct Burner | | Fuel Gas, LPG | | 270.1 | | | | | | | | | | | |

Notes:
(1) Max. Design Capacity (LHV) based on 1994 PTO values updated to 1995 values. Normal East Flaring Scenario. GT-9 (G-3409) and GT-10 (G-3410) maximum heat capacity per STX-TV-003-10 §§ 3.1.4.2.8 and 3.2.4.1.21
(2) Max. Design Capacity (HHV) = Max. Design Capacity (LHV) * HHV/LHV Ratio
Fuel Gas HHV/LHV = 1.091
Fuel Oil HHV/LHV = 1.055

(4) Fuel Oil Firing limited by permit:

| Process Unit | Turbines | STX-TV-003-10 Condition | Reduced-Fuel Op. Scenario | | | Normal Op. Scenario | | |
|---|---|---|---|---|---|---|---|---|
| | | | Distillate Oil (bbl/day) | Distillate Oil (bbl/yr) | Distillate Oil (MMBtu/hr) | Distillate Oil (bbl/day) | Distillate Oil (bbl/yr) | Distillate Oil (MMBtu/hr) |
| Power House 2 | G-3404, G-3405, G-3406, G-3407, G-3408, G-3409, G-3410 | §3.2.4.1.4 | 4,000 | 1,314,000 | 870.0 | 3,888 | 1,277,208 | 846 |

(a) Barrel-Of-Oil-Equivalent (BOE) per 26 U.S.C. Title 26, Subtitle A, Chapter 1, Subchapter A, Part IV, Subpart D, §45K(d)(5):
MMBtu/BOE = 5.8
(b) Fuel Oil (bbl/yr) = Fuel Oil (bbl/day) * 365 days/yr * 0.9 [per PSD permit]

(5) NOx emissions GT-4, GT-5, GT-6, GT-7 and GT-8 must meet 40 CFR Part 60, Subpart GG NOx emission standard per Consent Decree Paragraph 136 and STX-TV-003-10 §3.2.4.1.7

| Parameter | Units | GT-4 (G-3404) | | GT-5 (G-3405) | | GT-7 (G3407) | | GT-8 (G-3408) | |
|---|---|---|---|---|---|---|---|---|---|
| | | Natural Gas | Distillate Oil | Natural Gas | Distillate Oil | Natural Gas | Distillate Oil | Natural Gas | Distillate Oil |
| Design Heat Rate (LHV) | Btu/kWh | 12,810 | 13,481 | 12,810 | 13,481 | 12,810 | 14,732 | 12,300 | 12,390 |
| Design Heat Rate (LHV) | kJ/Wh | 13.5 | 14.2 | 13.5 | 14.2 | 13.5 | 15.5 | 13.0 | 13.1 |
| NOx | vol% @ 15%O2 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 |
| NOx | ppmvd @ 15%O2 | 160 | 152 | 160 | 152 | 160 | 150 | 166 | 165 |
| NOx | lb/MMBtu | 0.59 | 0.59 | 0.59 | 0.59 | 0.59 | 0.58 | 0.61 | 0.64 |

(a) Design heat rate per GE performance curves at peak load (GT-4 natural gas 3/23/197 and distillate 8/16/1991, GT-5 assumed equal to GT-4, GT-7 natural gas 3/23/1987 and distillate 11/10/1992, GT-8 natural gas 2/17/1989 and distillate 2/17/1989)
(b) NOx emission standard in vol% per §60.332 (a)(2):
NOx (vol%) = 0.015 · 14.4 / Y + F
STD = allowable ISO corrected [if required as given in §60.335(b)(1)] NOx emission concentration (vol% @ 15% O2 on a dry basis)
Y = manufacturer's rated heat rate at manufacturer's rated load (kilojoules per watt hour) or, actual measured heat rate based on lower heating value of fuel as measured at actual peak load for the facility.
The value of Y shall not exceed 14.4 kilojoules per watt hour
F = NOx emission allowance for fuel-bound nitrogen as defined in §60.332(a)(4). F = 0 if no fuel-bound nitrogen data is available.
(c) NOx (lb/MMBtu) = NOx (vol%) / 100 / Std. Molar Volume (scf/lbmole) * MW NO2 (lb/lbmole) * Fd (dscf/MMBtu) * 20.9/(20.9-O2%)

| | | | |
|---|---|---|---|
| Unit Conversion Factor = | 1,055 | J/Btu | |
| Standard Molar Volume = | 385.3 | scf/lbmole | [Universal Gas Law] |
| Factor Fd, Gases = | 8,710 | dscf/MMBtu | [Table 19-2, Method 19, 40 CFR 60, Gas] |
| Factor Fd, Oil = | 9,190 | dscf/MMBtu | [Table 19-2, Method 19, 40 CFR 60, Oil] |

**Limetree Bay Terminals and Refining**
**B-6 Seawater Intake Pumps Annual Potential to Emit**

| Default Emission Factors* | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Fuel | Units | NOx | CO | VOC | PM | PM10 | PM2.5 | SO2 | SO3 |
| Distillate Oil | lb/hp-hr | 0.031 | 0.0067 | 0.0025 | 0.0022 | 0.0022 | 0.0022 | 0.20 | 0.03 |

Notes:

*Refer to "Def. Emission Factors" tab

**Table 1. Seawater Intake Pumps Annual Potential to Emit**

| Process Unit | Source Identification (ID) | Unit Description | Brake HP | Annual Operating Hours | Fuels | Annual Potential to Emit | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | NOx | CO | VOC | PM | PM10 | PM2.5 | SO2 | H2SO4 |
| | | | | | | tpy | tpy | tpy | tpy | tpy | tpy | tpy | tpy |
| | | | (1) | | | (2), (4) | (2), (4) | (2), (4) | (2), (4) | (2), (4) | (2), (4) | (2), (3), (4) | (2), (4) |
| Seawater Intake | PD-1602 | Seawater intake pump | 277 | 500 | Distillate Oil | 2.1 | 0.5 | 0.2 | 0.2 | 0.2 | 0.2 | 13.9 | 2.1 |
| | PD-1603 | Seawater intake pump | 277 | 500 | Distillate Oil | 2.1 | 0.5 | 0.2 | 0.2 | 0.2 | 0.2 | 13.9 | 2.1 |
| | PD-1604 | Seawater intake pump | 277 | 500 | Distillate Oil | 2.1 | 0.5 | 0.2 | 0.2 | 0.2 | 0.2 | 13.9 | 2.1 |
| | PD-1605 | Seawater intake pump | 277 | 500 | Distillate Oil | 2.1 | 0.5 | 0.2 | 0.2 | 0.2 | 0.2 | 13.9 | 2.1 |
| | PD-1620 | Desalination pump | 185 | 500 | Distillate Oil | 1.4 | 0.3 | 0.1 | 0.1 | 0.1 | 0.1 | 9.3 | 1.4 |

Notes:
(1) Brake horsepower per equipment specifications
(2) Emission factors per AP-42, Chapter 3.3 , Table 3.3-1 Emission factors for Uncontrolled Diesel Industrial Engines.
SO2 emission factor based on mass balance as detailed in note (3) below
Assumed 10% SO2 oxidizes to SO3 and 100% of SO3 formed oxidizes to H2SO4
(3) SO2 emissions per maximum authorized sulfur content (blue font is a calculated number not a permit limit):

| Process Unit | Pumps | STX-TV-003-10 Condition | Fuel | Sulfur (wt%) | SO2 (lb/MMBtu) |
|---|---|---|---|---|---|
| Seawater Intake | PD-1602, PD-1603, PD-1604, PD-1605 and PD-1620 | 3.2.15.1 | Distillate Oil | 0.2 | 0.20 |

(a) Distillate OIl SO2 (lb/MMBtu) = Sulfur (wt%) * Fuel Density (lb/gal) * MW SO2 (lb/lbmole) / MW S (lb/lbmole) / Fuel Heat Input (MMBtu/gal)

| | | | |
|---|---|---|---|
| Distillate Oil Heat Input = | 0.140 | MMBtu/gal | [AP-42, Ch. 1.3] |
| Distillate Oil Density = | 7.05 | lb/gal | [No. 2 Oil Density per AP-42, Ch. 1.3, Table 1.3-12] |

(4) PTE (tpy) = Brake HP * Emission Factor (lb/HP-hr) * Annual Hours of Operation (hr/yr) * 1 ton/2,000 lb
Example: NOx PTE PD-1602 = 277.00HP/hr * 0.03 lb/hp-hr * 500 hr/yr * 1 ton/2,000 lb = 2.1 tpy

**Limetree Bay Terminals and Refining**
**B-7 Beavon Units Stacks Annual Potential to Emit**

**Description**: The West and East side Sulfur Recovery Plants (SRPs) consist of two Claus Trains (1 & 2 and 3 & 4 respectively) and a single Beavon Stretford Tail Gas Unit (#1 and # 2 respectively), that serves as the control device for the Claus trains. During maintenance, startup, shutdown and malfunction of the Beavon units, the tail gas is combusted in an incinerator (H-1042 and H-4745 respectively). Both East and West SRPs are subject to the requirements of subpart Ja of 40 CFR 60 per Consent Decree ¶42 requirements.

**Table 1 - Beavon Units Potential to Emit**

| Parameter | Units | #1 Beavon Stack (T-1061) | | | | #2 Beavon Stack (T-4761) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | CO | H2S | TRS(6) | VOC(7) | CO | H2S | TRS(6) | VOC(7) |
| Tail Gas Maximum Gas Rate(1) | MMscfd (wet) | - | | | | 30 | | | |
| Tail Gas Water Content | % | - | | | | 20 | | | |
| Tail Gas Maximum Gas Rate(2) | MMscfd (dry) | 18 | | | | 24 | | | |
| Standard Molar Volume(2) | scf/lbmole | 385 | | | | 385 | | | |
| Tail Gas Concentration(3) | ppmvd | 1,221 | 10 | 66.0 | | 1,221 | 10 | 66.0 | |
| Molecular Weight | lb/lbmole | 28 | 34.1 | 64.1 | | 28 | 34.1 | 64.1 | |
| Hourly Emission(4) | lb/hr | 66.6 | 0.7 | 8.2 | | 88.8 | 0.9 | 11.0 | |
| **Annual Emission(5)** | **tpy** | **292** | **2.9** | **36.0** | **36.0** | **389** | **3.9** | **48.1** | **48.1** |

Notes:

(1) Based on peak monthly tail gas from August 2003

(2) Universal Gas Law (68 °F, 1 atm)

(3) Tail Gas Concentration:

| | CO | H2S | TRS |
|---|---|---|---|
| Max of Beavon 1&2 of data averaged from 2004 to 2009 (GC data in ppm dry) | 1,221 | | |
| Title V STX-TV-003-10, Section 3.2.7.1 (1997 PSD Permit IV.G.) | | 50 | |
| NSPS Subparts Ja §60.102a(f)(1)(ii) and (iii) (ppmvd) | | 10 | 300 |
| Consent Decree Appendix H, Final TRS limit (ppmvd 30 day rolling average) | | | 66 |
| Consent Decree Appendix H, Final TRS limit (ppmvd 12 hr rolling average) | | | 162 |

(4) Hourly Emission (lb/hr) = Tail Gas Max. Gas Rate (MMscf/day) * 1,000,000 scf/MMscf * 1 day/ 24 hr * Tail Gas Pollutant Conc (ppmvd)/1,000,000 / Standard Molar Volume (scf/lbmole) * MWpollutant (lb/lbmole)

Example: #1 Beavon Hourly CO Emission = 18 MMscf/day * 1,000,000 scf/MMscf * 1 day/24 hr * 1,221 ppmvd/1,000,000 / 385 scf/lbmole * 28 lb/lbmole = 66.6 lb/hr

(5) Annual Emission (tpy) = Hourly Emission (lb/hr) * 8760 hr/yr * 1 ton/2,000 lb

Example: #1 Beavon Annual CO Emission = 66.6 lb/hr * 8760 hr/yr * 1 ton/2,000 lb = 292 tpy

(6) Total Reduced Sulfur (TRS) compounds means hydrogen sulfide (H2S), carbonyl sulfide (COS) and carbon disulfide (CS2) [40 CFR §60.101 and §60.101a]

(7) Conservatively assumed TRS = VOC

## Limetree Bay Terminals and Refining
## B-8 Sulfur Pits Annual Potential to Emit

**Table 1 - Sulfur Pits Venting**

| Parameter | Units | West Sulfur Pit | East Sulfur Pits | |
|---|---|---|---|---|
| | | SRUs 1 & 2 | SRU 3 | SRU 4 |
| Maximum elemental sulfur(1) | lbmole/hr | 0.0056 | 0.0035 | 0.0041 |
| Maximum H2S(2) | lbmole/hr | 0.209 | 0.142 | 0.142 |
| PM or PM10 or PM2.5(3) | lb/hr | 0.2 | 0.1 | 0.1 |
| H2S or TRS(3) | lb/hr | 7.1 | 4.8 | 4.8 |
| Max. Venting Hours per Year(4) | hr/yr | 240 | 240 | 240 |
| PM or PM10 or PM2.5(5) | tpy | 0.02 | 0.01 | 0.02 |
| H2S or TRS | tpy | 0.85 | 0.58 | 0.58 |

Notes:

(1) Based on liquid-vapor equilibrium, HOVENSA, November 2009

(2) Site data

(3) Hourly Emissions (lb/hr) = Molar Emission Rate (lbmole/hr) * Molecular Weight Sulfur (lb/lbmole)

Example: West Sulfur Pit PM Emissions = 0.0056 lbmole/hr * 32.1 lb/lbmole = 0.2 lb/hr

(4) NSPS Ja allowance for maintenance [§60.102a(f)(3)]

(5) Annual Emissions (tpy) = Hourly Emissions (lb/hr) * Max. Venting (hr/yr) * 1 ton/2,000 lb

Example West Sulfur Pit PM Emissions = 0.2 lb/hr * 240 hr/yr * 1 ton/2,000 lb = 0.02 tpy

**Limetree Bay Terminals and Refining**
**B-9 Beavons Cooling Towers Annual Potential to Emit**

**Description**: total dissolved solids (TDS) in the water through the Beavon Cooling Towers (CTs) becomes airborne particulates.

**Table 1 - Beavon Cooling Towers Particulates Potential to Emit**

| Parameter | Units | #1 Beavon | #2 Beavon |
|---|---|---|---|
| Flow(1) | gpm | 9,000 | 9,000 |
| Drift(2) | % of total circulating flow | 0.005 | 0.005 |
| TDS(3) | g/L | 190.0 | 194.4 |
| TDS(4) | ppmw | 190,015 | 194,354 |
| Estimated PM Emissions | tpy | 187.5 | 191.8 |
| Estimated PM10 Emissions | tpy | 0.38 | 0.39 |

Notes:
(1) Cooling Towers designed flowrate
(2) Assumed percent drift of total circulating flow
(3) Average Total Dissolved Solids (TDS) data from WinBLISS/LIMS lab data system from 2006

| | | #1 Beavon SRU TDS g/L | #2 Beavon SRU TDS g/L |
|---|---|---|---|
| 1/1/06 | 6/30/06 | 237.3 | 166.4 |
| 7/1/06 | 10/17/06 | 142.8 | 222.3 |

(4) TDS (ppmw) = TDS (g/L) * 1,000 mg/g
(5) PM emissions per AP-42, Chapter 13.4
Estimated PM Emissions (tpy) = Flowrate (gal/min) * 60 min/hr * 8760 hr/yr * Drift (%) * 3.785 L/gal * TDS (g/L) * 1 lb/453.59 g * 1 ton/2,000 lb
Example: #1 Beavon CT PM Emissions = 9,000 gal/min * 60 min/hr * 8760 hr/yr * 0.005/100 * 3.785 L/gal * 190.0 g/L * 1 lb/453.59 g * 1 ton/2,000 lb = 187.5 tpy
(6) PM10 (tpy) = PM (tpy) * Wt% PM10 (refer to Tables 2 and 3 for wt% PM10 calculations)
Example: #1 Beavon CT PM10 Emissions = 187.5 tpy * 0.204/100 = 0.38 tpy

**Table 2 - #1 Beavon Cooling Tower PM10 Emissions(1)**

| EPRI Droplet Diameter (µm) | Droplet Volume (µm3) | Droplet, Mass (µg) | Particle Mass (Solids) (µg) | Solid Particle Volume (µm3) | Solid Particle Diameter (µm) | EPRI % Mass Smaller | Wt% PMx in PM Emissions | PMx Solid Particle Diameter (µm) |
|---|---|---|---|---|---|---|---|---|
| 10 | 524 | 5.2E-04 | 9.9E-05 | 45 | 4.4 | - | | |
| 20 | 4,189 | 4.2E-03 | 8.0E-04 | 362 | 8.8 | 0.196 | | |
| 30 | 14,137 | 1.4E-02 | 2.7E-03 | 1,221 | 13.3 | 0.226 | 0.204 | 10.0 |
| 40 | 33,510 | 3.4E-02 | 6.4E-03 | 2,894 | 17.7 | 0.514 | | |
| 50 | 65,450 | 6.5E-02 | 1.2E-02 | 5,653 | 22.1 | 1.806 | | |
| 60 | 113,097 | 1.1E-01 | 2.1E-02 | 9,768 | 26.5 | 5.702 | | |
| 70 | 179,594 | 1.8E-01 | 3.4E-02 | 15,512 | 30.9 | 21.348 | 18.013 | 30.0 |
| 90 | 381,704 | 3.8E-01 | 7.3E-02 | 32,968 | 39.8 | 49.812 | | |
| 110 | 696,910 | 7.0E-01 | 1.3E-01 | 60,192 | 48.6 | 70.509 | | |
| 130 | 1,150,347 | 1.2E+00 | 2.2E-01 | 99,356 | 57.5 | 82.023 | | |
| 150 | 1,767,146 | 1.8E+00 | 3.4E-01 | 152,629 | 66.3 | 88.012 | | |
| 180 | 3,053,628 | 3.1E+00 | 5.8E-01 | 263,743 | 79.6 | 91.032 | | |
| 210 | 4,849,048 | 4.8E+00 | 9.2E-01 | 418,815 | 92.8 | 92.468 | 92.162 | 90.0 |
| 240 | 7,238,229 | 7.2E+00 | 1.4E+00 | 625,170 | 106.1 | 94.091 | | |
| 270 | 10,305,995 | 1.0E+01 | 2.0E+00 | 890,134 | 119.3 | 94.689 | | |
| 300 | 14,137,167 | 1.4E+01 | 2.7E+00 | 1,221,035 | 132.6 | 96.288 | | |
| 350 | 22,449,298 | 2.2E+01 | 4.3E+00 | 1,938,958 | 154.7 | 97.011 | | |
| 400 | 33,510,322 | 3.4E+01 | 6.4E+00 | 2,894,304 | 176.8 | 98.340 | | |
| 450 | 47,712,938 | 4.8E+01 | 9.1E+00 | 4,120,991 | 198.9 | 99.071 | | |
| 500 | 65,449,847 | 6.5E+01 | 1.2E+01 | 5,652,938 | 221.0 | 99.071 | | |
| 600 | 113,097,336 | 1.1E+02 | 2.1E+01 | 9,768,276 | 265.2 | 100.0 | | |

Notes:
(1) Estimated PMx Emissions calculated based on droplet size distribution using the mehtod described in "Calculating Realistic PM10 Emissions from Cooling Towers" by Joel Reisman and Gordo Frisbie.

**Limetree Bay Terminals and Refining**
**B-9 Beavons Cooling Towers Annual Potential to Emit**

**Table 3 - #2 Beavon Cooling Tower PM10 Emissions[(1)]**

| EPRI Droplet Diameter (µm) | Droplet Volume (µm3) | Droplet, Mass (µg) | Particle Mass (Solids) (µg) | Solid Particle Volume (µm3) | Solid Particle Diameter (µm) | EPRI % Mass Smaller | Wt% PMx in PM Emissions | PMx Solid Particle Diameter (µm) |
|---|---|---|---|---|---|---|---|---|
| 10 | 524 | 5.2E-04 | 1.0E-04 | 46 | 4.5 | - | | |
| 20 | 4,189 | 4.2E-03 | 8.1E-04 | 370 | 8.9 | 0.196 | | |
| 30 | 14,137 | 1.4E-02 | 2.7E-03 | 1,249 | 13.4 | 0.226 | 0.203 | 10.0 |
| 40 | 33,510 | 3.4E-02 | 6.5E-03 | 2,960 | 17.8 | 0.514 | | |
| 50 | 65,450 | 6.5E-02 | 1.3E-02 | 5,782 | 22.3 | 1.806 | | |
| 60 | 113,097 | 1.1E-01 | 2.2E-02 | 9,991 | 26.7 | 5.702 | | |
| 70 | 179,594 | 1.8E-01 | 3.5E-02 | 15,866 | 31.2 | 21.348 | 17.216 | 30.0 |
| 90 | 381,704 | 3.8E-01 | 7.4E-02 | 33,721 | 40.1 | 49.812 | | |
| 110 | 696,910 | 7.0E-01 | 1.4E-01 | 61,567 | 49.0 | 70.509 | | |
| 130 | 1,150,347 | 1.2E+00 | 2.2E-01 | 101,625 | 57.9 | 82.023 | | |
| 150 | 1,767,146 | 1.8E+00 | 3.4E-01 | 156,114 | 66.8 | 88.012 | | |
| 180 | 3,053,628 | 3.1E+00 | 5.9E-01 | 269,766 | 80.2 | 91.032 | | |
| 210 | 4,849,048 | 4.8E+00 | 9.4E-01 | 428,378 | 93.5 | 92.468 | 92.089 | 90.0 |
| 240 | 7,238,229 | 7.2E+00 | 1.4E+00 | 639,444 | 106.9 | 94.091 | | |
| 270 | 10,305,995 | 1.0E+01 | 2.0E+00 | 910,459 | 120.3 | 94.689 | | |
| 300 | 14,137,167 | 1.4E+01 | 2.7E+00 | 1,248,915 | 133.6 | 96.288 | | |
| 350 | 22,449,298 | 2.2E+01 | 4.4E+00 | 1,983,231 | 155.9 | 97.011 | | |
| 400 | 33,510,322 | 3.4E+01 | 6.5E+00 | 2,960,391 | 178.1 | 98.340 | | |
| 450 | 47,712,938 | 4.8E+01 | 9.3E+00 | 4,215,088 | 200.4 | 99.071 | | |
| 500 | 65,449,847 | 6.5E+01 | 1.3E+01 | 5,782,013 | 222.7 | 99.071 | | |
| 600 | 113,097,336 | 1.1E+02 | 2.2E+01 | 9,991,319 | 267.2 | 100.0 | | |

Notes:

(1) Estimated PMx Emissions calculated based on droplet size distribution using the mehtod described in "Calculating Realistic PM10 Emissions from Cooling Towers" by Joel Reisman and Gordo Frisbie.

**Limetree Bay Terminals and Refining**
**B-10 Flares Annual Potential to Emit**

**Table 1. Flare Systems Annual Potential to Emit**

| Air Pollutant | Emission Factor[(1),(2)] | | Potential to Emit (tpy)[(3),(4)] | | | |
|---|---|---|---|---|---|---|
| | lb/MMBtu (LHV) | lb/MMBtu (HHV) | West Side Refinery Flare System | East Side Refinery Flare System | FCC/Coker Refinery Flare System | Tank 7921 Flare System |
| NOx | | 0.068 | 643 | 1,328 | 427 | 38.2 |
| CO | 0.31 | | 2,685 | 5,585 | 1,794 | 160.4 |
| PM | | 0.0019 | 18 | 36 | 12 | 1.0 |
| PM10 | | 0.0075 | 70 | 146 | 47 | 4.2 |
| PM2.5 | | 0.0075 | 70 | 146 | 47 | 4.2 |
| VOC (NME) | 0.66 | | 7,652 | 19,695 | 7,323 | 341.6 |
| SO2 | | 0.236 | 2,230 | 4,252 | 1,481 | 132.7 |

Notes:
(1) NOx, CO and VOC emission factors per AP-42, Chapter 13.5, Tables 13.5-1 and 13.5-2. PM, PM10 and PM2.5 for non-smoking flares conservatively surrogated to boilers particulates emissions per AP-42, Chapter 1.4, Table 1.4-2. SO2 emission factor per NSPS Ja requirement.
(2) SO2 Emissions (lb/MMBtu) = SO2 ppmv/10^6 * 1/Std Volume (scf/lbmole) * $MW_{SO2}$ (lb/lbmole) * Fd (dscf/MMBtu) * 20.9/(20.9 - O2%)
Example: SO2 = 163 / 10^6 * 1 / 385.3 scf/lbmole * 64 lb/lbmole * 8,710 dscf/MMBtu * 20.9 / (20.9 - 0) = 0.236

| | | | |
|---|---|---|---|
| Standard Molar Volume = | 385.3 | scf/lbmole | |
| Factor Fd for fuel gas = | 8,710.0 | dscf/MMBtu | Table 19-2, Method 19, 40 CFR 60 |

(2) NOx, CO, PM, PM10, PM2.5, SO2 PTE (tpy) = (Pilot/Assist Gas Heat Release + Vent Gas Heat Release) (MMBtu/yr) * Emission Factor (lb/MMBtu) * 1 ton/2,000 lb
Refer to Table 3 for detail calculation of Heat Release
Example: Est Side Refinery Flare System NOx = (18,896,410 + 2,390) MMBtu/yr * 0.068 lb/MMBtu * 1 ton/2,000 lb = 643 tpy
Example: Est Side Refinery Flare System CO = (17,323,377 + 2,190) MMBtu/yr * 0.31 lb/MMBtu * 1 ton/2,000 lb = 2,685 tpy
(3) VOC Emissions (tpy) = (Pilot/Assist Gas Heat Release + Vent Gas Heat Release) (MMBtu/yr) * Emission Factor (lb/MMBtu) * 1 ton/2,000 lb + Uncombusted VOC PTE (tpy)
Refer to Table 2 for detail calculation of Uncombusted VOC and Table 3 for detail calculation of Heat Release
Example: Est Side Refinery Flare System VOC = (17,323,377 + 2,190) MMBtu/yr * 0.66 lb/MMBtu * 1 ton/2,000 lb + 1,935 tpy = 7,652 tpy

**Table 2. Flare Systems Uncombusted VOC Potential to Emit**

| Composition | Formula | Molecular Weight (lb/lbmole) | Flare DRE (%) | Uncombusted VOC Potential to Emit (tpy) | | |
|---|---|---|---|---|---|---|
| | | | | West Side Refinery Flare | East Side Refinery Flare System | FCC/Coker Refinery Flare |
| Methane | CH4 | 16.0 | 99 | 267 | 173 | 200 |
| Ethane | C2H6 | 30.1 | 99 | 344 | 137 | 183 |
| Ethylene | C2H4 | 28.1 | 99 | 115 | 87 | 148 |
| Propane | C3H8 | 44.1 | 99 | 328 | 943 | 832 |
| Propylene | C3H6 | 42.1 | 99 | 111 | 168 | 197 |
| iso-Butane | C4H10 | 58.1 | 98 | 227 | 917 | 1,358 |
| n-Butane | C4H10 | 58.1 | 98 | 261 | 1,133 | 278 |
| 1-Butene | C4H8 | 56.1 | 98 | 22 | 125 | 45 |
| Isobutylene | C4H8 | 56.1 | 98 | - | 16 | - |
| Trans-2-Butene | C4H8 | 56.1 | 98 | 33 | 161 | 45 |
| Cis-2-Butene | C4H8 | 56.1 | 98 | 33 | 120 | 34 |
| iso-Pentane | C5H12 | 72.1 | 98 | 127 | 1,634 | 101 |
| n-Pentane | C5H12 | 72.1 | 98 | 85 | 1,299 | 29 |
| C6+ | C6H14 | 86.2 | 98 | 708 | 1,288 | 585 |
| | | | **VOC (NME)** | 1,935 | 7,805 | 3,503 |

Notes:
(1) Uncombusted VOC (tpy) = Vent Gas Volumetric Flow (MMscf/yr) * 10^6 scf/MMscf / Std. Molar Volume (scf/lbmole) * Chemical (lbmole%) * MW (lb/lbmole) * 1 ton/2,000 lb * (1 - DRE)
Refer to Table 2 for detail calculation of Volumetric Flow and Table 4 for Normalized Max. Composition
Example: West Side Refinery Flare System - Propane = 12,504 MMscf/yr * 10^6 scf/MMscf / 385.3 scf/lbmole * 4.6/100 * 44.1 lb/lbmole * 1 ton/2,000 lb * (1 - 99/100) = 328 tpy

**Table 3. Flare Systems Potential Heat Release and Volumetric Flow**

| | Units | West Side Refinery Flare System | East Side Refinery Flare System | FCC/Coker Refinery Flare System | Reference |
|---|---|---|---|---|---|
| Refinery Side | | West | East | East | |
| Flares | | #2, #3 | #5, #6, #7 | LP, HP | |
| Process Units | | All Units | All Units | FCCU/DCU | |
| **2011 Processing Rate (Monthly Max)** | | | | | |
| Crude 2 | KBPD | 34.1 | | | 2011 annualized maximum monthly processing rate |
| Crude 3 | KBPD | 4.0 | | | |
| Crude 5 | KBPD | | 158.6 | | |
| Crude 6 | KBPD | | 168.1 | | |
| Sulfolane | KBPD | | 37.6 | | |
| FCCU | KBPD | | | 130.5 | |
| Coker | KBPD | | | 58.9 | |
| **2011 Max Flare Data** | | | | | |
| Gas Flared | MMSCF/YR | 3,115 | 11,261 | 6,904 | 2011 anualized maximum daily flaring |
| Heat Content, LHV | BTU/SCF | 1,385.4 | 2,808.2 | 1,504.3 | 2011 maximum heat content per sampling |
| Heat Content, HHV | BTU/SCF | 1,511.2 | 3,044.5 | 1,630.9 | |
| Heat Input from Flare, LHV | MMBTU/YR | 4,315,815 | 31,622,173 | 10,385,870 | Heat Input (MMBtu/yr) = Gas Flared (MMscf/yr) * Heat |
| Heat Input from Flare, HHV | MMBTU/YR | 4,707,708 | 34,283,066 | 11,259,803 | |
| Flaring Rate/barrel, LHV | MMBTU/BBL | 0.3 | 0.2 | 0.2 | Flaring Rate = Heat Input (MMBtu/yr) / ∑(Process Rate) (Kbbl/day) * 1 Kbbl/1,000 bbl * 1 yr/365 day |
| Flaring Rate/barrel, HHV | MMBTU/BBL | 0.3 | 0.3 | 0.2 | |
| Flaring Rate/barrel | MSCF/BBL | 0.2 | 0.1 | 0.1 | Flaring Rate = Gas Flared (MMscf/yr) / ∑(Process Rate) (Kbbl/day) * 1 yr/365 day |
| **CAP Processing Rates** | | | | | |
| Crude 2 | KBPD | 114.0 | | | Maximum CAP Processing Rates |
| Crude 3 | KBPD | 39.0 | | | |
| Crude 5 | KBPD | | 180.0 | | |
| Crude 6 | KBPD | | 195.0 | | |
| Sulfolane | KBPD | | 40.0 | | |
| FCCU | KBPD | | | 149.0 | |
| Coker | KBPD | | | 62.0 | |
| **CAP Flaring Rates** | | | | | |
| Heat Release, LHV | MMBtu/yr | 17,323,377 | 36,029,213 | 11,572,562 | Heat Release = Flaring Rate (MMBtu/bbl) * ∑(CAP Process Rate) (Kbbl/day) * 1,000 bbl/Kbbl * 365day/yr |
| Heat Release, HHV | MMBtu/yr | 18,896,410 | 39,060,943 | 12,546,352 | |
| Volumetric Flow | MMscf/yr | 12,504 | 12,830 | 7,693 | Volumetric Flow = Flaring Rate (Mscf/bbl) * ∑(CAP Process Rate) (Kbbl/day) * 365day/yr |
| **Pilot/Assist Flaring Rates** | | | | | |
| Heat Release, LHV | MMBtu/yr | 2,190 | 2,190 | 2,190 | Based on 250,000 Btu/hr |
| Heat Release, HHV | MMBtu/yr | 2,390 | 2,390 | 2,390 | Fuel Gas - Heat Ratio (HHV/LHV) = 1.091 |
| Volumetric Flow | MMscf/yr | 1.79 | 1.79 | 1.79 | Fuel Gas - Heat Input (HHV) = 1,333 Btu/scf |

**Table 4. Flare Systems VOC Speciation**

| Composition | Formula | 2011 Max. Composition (lbmole%) | | | Normalized Max. Composition (lbmole%) | | |
|---|---|---|---|---|---|---|---|
| | | West Side Refinery Flare System | East Side Refinery Flare System | FCC/Coker Refinery Flare | West Side Refinery Flare | East Side Refinery Flare System | FCC/Coker Refinery Flare |
| Hydrogen | H2 | 41.3 | 80.6 | 10.4 | 24.9 | 22.5 | 10.4 |
| Nitrogen | N2 | 68.3 | 59.9 | 22.1 | 41.2 | 16.7 | 22.1 |
| Hydrogen Sulfide | H2S | 1.8 | 16.4 | - | 1.1 | 4.6 | - |
| Carbon Dioxide | CO2 | 0.5 | 1.3 | 0.5 | 0.3 | 0.4 | 0.5 |
| Methane | CH4 | 17.0 | 23.3 | 12.5 | 10.2 | 6.5 | 12.5 |
| Ethane | C2H6 | 11.7 | 9.8 | 6.1 | 7.1 | 2.7 | 6.1 |
| Ethylene | C2H4 | 4.2 | 6.7 | 5.3 | 2.5 | 1.9 | 5.3 |
| Propane | C3H8 | 7.6 | 46.1 | 18.9 | 4.6 | 12.9 | 18.9 |
| Propylene | C3H6 | 2.7 | 8.6 | 4.7 | 1.6 | 2.4 | 4.7 |
| iso-Butane | C4H10 | 2.0 | 17.0 | 11.7 | 1.2 | 4.7 | 11.7 |
| n-Butane | C4H10 | 2.3 | 21.0 | 2.4 | 1.4 | 5.9 | 2.4 |
| 1-Butene | C4H8 | 0.2 | 2.4 | 0.4 | 0.1 | 0.7 | 0.4 |
| Isobutylene | C4H8 | - | 0.3 | - | - | 0.1 | - |
| Trans-2-Butene | C4H8 | 0.3 | 3.1 | 0.4 | 0.2 | 0.9 | 0.4 |
| Cis-2-Butene | C4H8 | 0.3 | 2.3 | 0.3 | 0.2 | 0.6 | 0.3 |
| iso-Pentane | C5H12 | 0.9 | 24.4 | 0.7 | 0.5 | 6.8 | 0.7 |
| n-Pentane | C5H12 | 0.6 | 19.4 | 0.2 | 0.4 | 5.4 | 0.2 |
| C6+ | C6H14 | 4.2 | 16.1 | 3.4 | 2.5 | 4.5 | 3.4 |
| | | 165.9 | 358.7 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table 5. Refrigerated LPG Tank to Flare Release**

| Refrigerated LPG Tank | | |
|---|---|---|
| Tank ID | TK-7921 | |
| Location | Area 5 | |
| Tank Type | Refrigerated Fixed RoofVents to Flare | |
| Material Stored | LPG | |
| Tank Diameter | 154 | ft |
| Tank Height | 75.8 | ft |
| Tank Volume | 11,000 | 10^3 gal |
| Propane HHV | 91.5 | MMBtu/10^3 gal (AP-42, Chapter 1.5) |
| Butane HHV | 102.0 | MMBtu/10^3 gal (AP-42, Chapter 1.5) |
| Maximum Release | 1,032,821 | MMBtu/yr (LHV) |
| Maximum Release | 1,122,000 | MMBtu/yr (HHV) |

| Pilot/Assist Flaring Rates | | | |
|---|---|---|---|
| Heat Release, LHV | MMBtu/yr | 2,190 | Based on 250,000 Btu/hr |
| Heat Release, HHV | MMBtu/yr | 2,390 | Fuel Gas - Heat Ratio (HHV/LHV) = 1.091 |
| Volumetric Flow | MMscf/yr | 1.79 | Fuel Gas - Heat Input (HHV) = 1,333 Btu/scf |

**Limetree Bay Terminals and Refining**
**B-11 Tanks Annual Potential to Emit**

<u>Description</u>: The facility is designed to store multiple petroleum products, chemicals, wastewater and water in 271 tanks, including external floating roof tanks (EXT), internal floating roof tanks (INT), fixed roof tanks (CR and DR) and open tanks.
Tank VOC emissions has been estimated according to AP-42, Chapter 7 Liquid Storage Tanks equations. For purposes of potential to emit the following assumptions were made:

(a) All floating roof tanks were modeled as in Gasoline (RVP 13) service, except TK-6816, TK-6838, TK-6839 and TK-7447, which were modeled at the service established by the MARPOL Project since it resulted in a higher PTE.
(b) All fixed roof tanks were modeled as in Light Cycle Oil service, except TK-6825, TK-7405, TK-7406, TK-7415, TK-7446, which were modeled in service established by the MARPOL Project since it resulted in a higher PTE.
(c) TK-8501 stores pitch. VOC, CO and PM/PM10/PM2.5 emissions were estimated using AP-42 Chapter 7 equations and Chapter 11.1
TK-8501 is subject to NSPS subpart Kb, 60.110b. Per STX-TV-003-10, Condition 3.1.10.1 and 2 the VOC shall not exceed 7.3 tpy and is restricted from storing material with a true vapor pressure greater than 0.5 psia.
(d) All floating roof tank emissions estimates where limited to a maximum true vapor pressure of 11.1 psia (None routed to a control device per §60.112a)
(e) No emissions were estimated for open roof tanks, since these tanks are used for water and/or wastewater with no VOC content storage. Emissions from tanks associated with the WWTP are determine as part of the Wastewater Treatment Plant's emissions.
(f) The tank volume was conservatively used instead of the tank working volume.
(g) A total of 3 turnovers per week (156 turnovers per year) was assumed for each tank.
(h) A total of 10 roof landings per year per tank were used as the basis for landings.
(i) Roof landings were conservatively assumed to be full heel with 3 days in standing idle per event per tank.

**Table 1. Tanks Annual Potential to Emit**

| Tank ID | Tank Type | PTE Material Stored | VERTICAL FIXED ROOF TANKS | | | HORIZONTAL FIXED ROOF TANKS | | | FLOATING ROOF TANKS | | | | | ROOF LANDINGS | | | VOC PTE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Standing Storage Loss | Working Loss | VOC Annual Emissions | Standing Storage Loss | Working Loss | VOC Annual Emissions | Rim Seal Loss | Withdrawal Loss | Deck Fitting Loss | Deck Seam Loss | VOC Annual Emissions | Standing Idle Losses | Filling Losses | VOC Annual Emissions | |
| | | | LS | LW | | LS | LW | | LR | LWD | LF | LD | | LSL | LFL | | |
| | | | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | ton/yr | ton/yr |
| | | | AP-42, Ch. 7.1, Eq. 1-2 | AP-42, Ch. 7.1 Eq. 1-29 | AP-42, Ch. 7.1 Eq. 1-1 | AP-42, Ch. 7.1, Eq. 1-2 | AP-42, Ch. 7.1 Eq. 1-29 | AP-42, Ch. 7.1 Eq. 1-1 | AP-42, Ch. 7.1 Eq. 2-2 | AP-42, Ch. 7.1, Eq. 2-4 | AP-42, Ch. 7.1, Eq. 2-5 | AP-42, Ch. 7.1, Eq. 2-9 | AP-42, Ch. 7.1 Eq. 2-1 | AP-42, Ch. 7.1 Eq. 2-13 or 2-16, 2-19 Eq. 2-23 or 2-20 | AP-42, Ch. 7.1, Eq. 2-26 or 2-27 | AP-42, Ch. 7.1 Eq. 2-10 | |
| | | | (1) | (2) | (3) | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| TK01PR | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 21,685.56 | 1,053.67 | 20,801.03 | 8,503.67 | 26.0 | 39,322 | 41,509 | 40.4 | 66.4 |
| TK02PR | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 21,685.56 | 1,053.67 | 20,801.03 | 8,503.67 | 26.0 | 39,322 | 41,509 | 40.4 | 66.4 |
| TK03PR | CR | Light Cycle Oil | 619.8 | 5,785.0 | 3.2 | - | - | - | - | - | - | - | - | - | - | - | 3.2 |
| TK04PR | CR | Light Cycle Oil | 391.5 | 2,573.5 | 1.5 | - | - | - | - | - | - | - | - | - | - | - | 1.5 |
| TK05PR | CR | Light Cycle Oil | 391.5 | 2,573.5 | 1.5 | - | - | - | - | - | - | - | - | - | - | - | 1.5 |
| TK06PR | CR | Light Cycle Oil | 391.5 | 2,573.5 | 1.5 | - | - | - | - | - | - | - | - | - | - | - | 1.5 |
| TK07PR | DR | Light Cycle Oil | 511.4 | 3,088.2 | 1.8 | - | - | - | - | - | - | - | - | - | - | - | 1.8 |
| TK0702 | CR | Light Cycle Oil | 553.7 | 5,249.2 | 2.9 | - | - | - | - | - | - | - | - | - | - | - | 2.9 |
| TK1061 | OPEN | CHEMICALS | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK1062 | OPEN | CHEMICALS | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK1063 | OPEN | CHEMICALS | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK1064 | OPEN | CHEMICALS | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK1065 | OPEN | CHEMICALS | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK1066 | FLAT | Light Cycle Oil | 0.1 | 1.1 | 0.001 | - | - | - | - | - | - | - | - | - | - | - | 0.001 |
| TK1071 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 3,132.42 | 359.52 | 2,882.18 | - | 3.2 | 14,388 | 4,632 | 9.5 | 12.7 |
| TK1118 | CR | Light Cycle Oil | 5.3 | 30.6 | 0.02 | - | - | - | - | - | - | - | - | - | - | - | 0.0 |
| TK1151 | CR | Light Cycle Oil | 373.7 | 2,457.9 | 1.4 | - | - | - | - | - | - | - | - | - | - | - | 1.4 |
| TK1156 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 803.51 | 29.04 | - | - | 0.4 | 314 | 259 | 0.3 | 0.7 |
| TK1157 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 803.51 | 29.04 | - | - | 0.4 | 314 | 259 | 0.3 | 0.7 |
| TK1201 | CR | Light Cycle Oil | 10.3 | 68.1 | 0.04 | - | - | - | - | - | - | - | - | - | - | - | 0.04 |
| TK1202 | CR | Light Cycle Oil | 10.9 | 72.3 | 0.04 | - | - | - | - | - | - | - | - | - | - | - | 0.04 |
| TK1203 | CR | Light Cycle Oil | 10.9 | 72.3 | 0.04 | - | - | - | - | - | - | - | - | - | - | - | 0.04 |
| TK1204 | HFR | Light Cycle Oil | - | - | - | 4.3 | 25.4 | 0.0 | - | - | - | - | - | - | - | - | 0.01 |
| TK1205 | HFR | Light Cycle Oil | - | - | - | 4.3 | 25.4 | 0.0 | - | - | - | - | - | - | - | - | 0.01 |
| TK1206 | FLAT | Light Cycle Oil | 16.9 | 113.0 | 0.1 | - | - | - | - | - | - | - | - | - | - | - | 0.1 |
| TK1207 | FLAT | Light Cycle Oil | 16.9 | 113.0 | 0.1 | - | - | - | - | - | - | - | - | - | - | - | 0.1 |
| TK1208 | FR | Light Cycle Oil | 21.0 | 140.7 | 0.1 | - | - | - | - | - | - | - | - | - | - | - | 0.1 |
| TK1236 | FR | Light Cycle Oil | 13.7 | 131.2 | 0.1 | - | - | - | - | - | - | - | - | - | - | - | 0.1 |
| TK1301 | HFR | Light Cycle Oil | - | - | - | 11.6 | 109.4 | 0.1 | - | - | - | - | - | - | - | - | 0.1 |
| TK1302 | DR | Light Cycle Oil | 88.7 | 519.3 | 0.3 | - | - | - | - | - | - | - | - | - | - | - | 0.3 |
| TK1304 | HFR | Light Cycle Oil | - | - | - | 2.4 | 23.0 | 0.0 | - | - | - | - | - | - | - | - | 0.01 |
| TK1305 | HFR | Light Cycle Oil | - | - | - | 2.4 | 23.0 | 0.0 | - | - | - | - | - | - | - | - | 0.01 |

**Limetree Bay Terminals and Refining**
**B-11 Tanks Annual Potential to Emit**

<u>Description</u>: The facility is designed to store multiple petroleum products, chemicals, wastewater and water in 271 tanks, including external floating roof tanks (EXT), internal floating roof tanks (INT), fixed roof tanks (CR and DR) and open tanks.
Tank VOC emissions has been estimated according to AP-42, Chapter 7 Liquid Storage Tanks equations. For purposes of potential to emit the following assumptions were made:

(a) All floating roof tanks were modeled as in Gasoline (RVP 13) service, except TK-6816, TK-6838, TK-6839 and TK-7447, which were modeled at the service established by the MARPOL Project since it resulted in a higher PTE.
(b) All fixed roof tanks were modeled as in Light Cycle Oil service, except TK-6825, TK-7405, TK-7406, TK-7415, TK-7446, which were modeled in service established by the MARPOL Project since it resulted in a higher PTE.
(c) TK-8501 stores pitch. VOC, CO and PM/PM10/PM2.5 emissions were estimated using AP-42 Chapter 7 equations and Chapter 11.1
TK-8501 is subject to NSPS subpart Kb, 60.110b. Per STX-TV-003-10, Condition 3.1.10.1 and 2 the VOC shall not exceed 7.3 tpy and is restricted from storing material with a true vapor pressure greater than 0.5 psia.
(d) All floating roof tank emissions estimates where limited to a maximum true vapor pressure of 11.1 psia (None routed to a control device per §60.112a)
(e) No emissions were estimated for open roof tanks, since these tanks are used for water and/or wastewater with no VOC content storage. Emissions from tanks associated with the WWTP are determine as part of the Wastewater Treatment Plant's emissions.
(f) The tank volume was conservatively used instead of the tank working volume.
(g) A total of 3 turnovers per week (156 turnovers per year) was assumed for each tank.
(h) A total of 10 roof landings per year per tank were used as the basis for landings.
(i) Roof landings were conservatively assumed to be full heel with 3 days in standing idle per event per tank.

**Table 1. Tanks Annual Potential to Emit**

| Tank ID | Tank Type | PTE Material Stored | VERTICAL FIXED ROOF TANKS | | | HORIZONTAL FIXED ROOF TANKS | | | FLOATING ROOF TANKS | | | | | ROOF LANDINGS | | | VOC PTE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Standing Storage Loss | Working Loss | VOC Annual Emissions | Standing Storage Loss | Working Loss | VOC Annual Emissions | Rim Seal Loss | Withdrawal Loss | Deck Fitting Loss | Deck Seam Loss | VOC Annual Emissions | Standing Idle Losses | Filling Losses | VOC Annual Emissions | |
| | | | LS | LW | | LS | LW | | LR | LWD | LF | LD | | LSL | LFL | | |
| | | | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | ton/yr | ton/yr |
| | | | AP-42, Ch. 7.1, Eq. 1-2 | AP-42, Ch. 7.1 Eq. 1-29 | AP-42, Ch. 7.1 Eq. 1-1 | AP-42, Ch. 7.1, Eq. 1-2 | AP-42, Ch. 7.1 Eq. 1-29 | AP-42, Ch. 7.1 Eq. 1-1 | AP-42, Ch. 7.1 Eq. 2-2 | AP-42, Ch. 7.1, Eq. 2-4 | AP-42, Ch. 7.1, Eq. 2-5 | AP-42, Ch. 7.1, Eq. 2-9 | AP-42, Ch. 7.1 Eq. 2-1 | AP-42, Ch. 7.1 Eq. 2-13 or 2-16, 2-19 Eq. 2-23 or 2-20 | AP-42, Ch. 7.1, Eq. 2-26 or 2-27 | AP-42, Ch. 7.1 Eq. 2-10 | |
| | | | (1) | (2) | (3) | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| TK1401 | FR | Light Cycle Oil | 2.1 | 19.4 | 0.01 | - | - | - | - | - | - | - | - | - | - | - | 0.01 |
| TK1600 | CR | Light Cycle Oil | 3.2 | 29.5 | 0.02 | - | - | - | - | - | - | - | - | - | - | - | 0.02 |
| TK1621 | FR | Light Cycle Oil | 117.1 | 1,123.7 | 0.6 | - | - | - | - | - | - | - | - | - | - | - | 0.6 |
| TK1622 | FR | Light Cycle Oil | 117.1 | 1,123.7 | 0.6 | - | - | - | - | - | - | - | - | - | - | - | 0.6 |
| TK1626 | HFR | Light Cycle Oil | - | - | - | 24.2 | 122.9 | 0.1 | - | - | - | - | - | - | - | - | 0.1 |
| TK1627 | HFR | Light Cycle Oil | - | - | - | 24.2 | 122.9 | 0.1 | - | - | - | - | - | - | - | - | 0.1 |
| TK1628 | HFR | Light Cycle Oil | - | - | - | 24.2 | 122.9 | 0.1 | - | - | - | - | - | - | - | - | 0.1 |
| TK1629 | HFR | Light Cycle Oil | - | - | - | 24.2 | 122.9 | 0.1 | - | - | - | - | - | - | - | - | 0.1 |
| TK1630 | HFR | Light Cycle Oil | - | - | - | 21.3 | 108.4 | 0.1 | - | - | - | - | - | - | - | - | 0.1 |
| TK1631 | HFR | Light Cycle Oil | - | - | - | 18.1 | 92.2 | 0.1 | - | - | - | - | - | - | - | - | 0.1 |
| TK1632 | HFR | Light Cycle Oil | - | - | - | 16.4 | 83.1 | 0.0 | - | - | - | - | - | - | - | - | 0.05 |
| TK1633 | HFR | Light Cycle Oil | - | - | - | 16.4 | 83.1 | 0.0 | - | - | - | - | - | - | - | - | 0.05 |
| TK1653 | HFR | Light Cycle Oil | - | - | - | 18.8 | 110.0 | 0.1 | - | - | - | - | - | - | - | - | 0.1 |
| TK1663 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 3,523.97 | 373.40 | - | - | 1.9 | 16,187 | 5,862 | 11.0 | 13.0 |
| TK2653 | CR | Light Cycle Oil | 15.1 | 99.7 | 0.1 | - | - | - | - | - | - | - | - | - | - | - | 0.1 |
| TK2654 | CR | Light Cycle Oil | 22.7 | 152.9 | 0.1 | - | - | - | - | - | - | - | - | - | - | - | 0.1 |
| TK3201 | FR | Light Cycle Oil | 5.1 | 33.2 | 0.0 | - | - | - | - | - | - | - | - | - | - | - | 0.0 |
| TK3202 | DR | Light Cycle Oil | 76.4 | 469.0 | 0.3 | - | - | - | - | - | - | - | - | - | - | - | 0.3 |
| TK3203 | CR | Light Cycle Oil | 11.8 | 109.4 | 0.1 | - | - | - | - | - | - | - | - | - | - | - | 0.1 |
| TK3204 | FR | Light Cycle Oil | 1.3 | 8.3 | 0.005 | - | - | - | - | - | - | - | - | - | - | - | 0.005 |
| TK3205 | FR | Light Cycle Oil | 1.4 | 13.1 | 0.007 | - | - | - | - | - | - | - | - | - | - | - | 0.01 |
| TK3208 | CR | Light Cycle Oil | 35.3 | 230.5 | 0.1 | - | - | - | - | - | - | - | - | - | - | - | 0.1 |
| TK3209 | HFR | Light Cycle Oil | - | - | - | 11.3 | 106.3 | 0.1 | - | - | - | - | - | - | - | - | 0.1 |
| TK3301 | CR | Light Cycle Oil | 1,213.6 | 6,246.2 | 3.7 | - | - | - | - | - | - | - | - | - | - | - | 3.7 |
| TK3302 | DR | Light Cycle Oil | 2,435.1 | 13,209.4 | 7.8 | - | - | - | - | - | - | - | - | - | - | - | 7.8 |
| TK3303 | OPEN | WATER | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK3304 | CR | Light Cycle Oil | 870.3 | 5,742.5 | 3.3 | - | - | - | - | - | - | - | - | - | - | - | 3.3 |
| TK3305 | CR | Light Cycle Oil | 553.7 | 5,249.2 | 2.9 | - | - | - | - | - | - | - | - | - | - | - | 2.9 |
| TK3306 | CR | Light Cycle Oil | 262.0 | 1,328.4 | 0.8 | - | - | - | - | - | - | - | - | - | - | - | 0.8 |
| TK3384 | DR | Light Cycle Oil | 20.5 | 119.6 | 0.1 | - | - | - | - | - | - | - | - | - | - | - | 0.1 |
| TK3385 | DR | Light Cycle Oil | 20.5 | 119.6 | 0.1 | - | - | - | - | - | - | - | - | - | - | - | 0.1 |
| TK3386 | DR | Light Cycle Oil | 100.9 | 581.4 | 0.3 | - | - | - | - | - | - | - | - | - | - | - | 0.3 |

**Limetree Bay Terminals and Refining**
**B-11 Tanks Annual Potential to Emit**

<u>Description</u>: The facility is designed to store multiple petroleum products, chemicals, wastewater and water in 271 tanks, including external floating roof tanks (EXT), internal floating roof tanks (INT), fixed roof tanks (CR and DR) and open tanks.
Tank VOC emissions has been estimated according to AP-42, Chapter 7 Liquid Storage Tanks equations. For purposes of potential to emit the following assumptions were made:
(a) All floating roof tanks were modeled as in Gasoline (RVP 13) service, except TK-6816, TK-6838, TK-6839 and TK-7447, which were modeled at the service established by the MARPOL Project since it resulted in a higher PTE.
(b) All fixed roof tanks were modeled as in Light Cycle Oil service, except TK-6825, TK-7405, TK-7406, TK-7415, TK-7446, which were modeled in service established by the MARPOL Project since it resulted in a higher PTE.
(c) TK-8501 stores pitch. VOC, CO and PM/PM10/PM2.5 emissions were estimated using AP-42 Chapter 7 equations and Chapter 11.1
TK-8501 is subject to NSPS subpart Kb, 60.110b. Per STX-TV-003-10, Condition 3.1.10.1 and 2 the VOC shall not exceed 7.3 tpy and is restricted from storing material with a true vapor pressure greater than 0.5 psia.
(d) All floating roof tank emissions estimates where limited to a maximum true vapor pressure of 11.1 psia (None routed to a control device per §60.112a)
(e) No emissions were estimated for open roof tanks, since these tanks are used for water and/or wastewater with no VOC content storage. Emissions from tanks associated with the WWTP are determine as part of the Wastewater Treatment Plant's emissions.
(f) The tank volume was conservatively used instead of the tank working volume.
(g) A total of 3 turnovers per week (156 turnovers per year) was assumed for each tank.
(h) A total of 10 roof landings per year per tank were used as the basis for landings.
(i) Roof landings were conservatively assumed to be full heel with 3 days in standing idle per event per tank.

**Table 1. Tanks Annual Potential to Emit**

| Tank ID | Tank Type | PTE Material Stored | VERTICAL FIXED ROOF TANKS | | | HORIZONTAL FIXED ROOF TANKS | | | FLOATING ROOF TANKS | | | | | ROOF LANDINGS | | | VOC PTE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Standing Storage Loss | Working Loss | VOC Annual Emissions | Standing Storage Loss | Working Loss | VOC Annual Emissions | Rim Seal Loss | Withdrawal Loss | Deck Fitting Loss | Deck Seam Loss | VOC Annual Emissions | Standing Idle Losses | Filling Losses | VOC Annual Emissions | |
| | | | LS | LW | | LS | LW | | LR | LWD | LF | LD | | LSL | LFL | | |
| | | | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | ton/yr | ton/yr |
| | | | AP-42, Ch. 7.1, Eq. 1-2 | AP-42, Ch. 7.1 Eq. 1-29 | AP-42, Ch. 7.1 Eq. 1-1 | AP-42, Ch. 7.1, Eq. 1-2 | AP-42, Ch. 7.1 Eq. 1-29 | AP-42, Ch. 7.1 Eq. 1-1 | AP-42, Ch. 7.1 Eq. 2-2 | AP-42, Ch. 7.1, Eq. 2-4 | AP-42, Ch. 7.1, Eq. 2-5 | AP-42, Ch. 7.1, Eq. 2-9 | AP-42, Ch. 7.1 Eq. 2-1 | AP-42, Ch. 7.1 Eq. 2-13 or 2-16, 2-19 Eq. 2-23 or 2-20 | AP-42, Ch. 7.1, Eq. 2-26 or 2-27 | AP-42, Ch. 7.1 Eq. 2-10 | |
| | | | (1) | (2) | (3) | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| TK4501 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 10,039.10 | 506.09 | 7,543.18 | 1,966.60 | 10.0 | 6,856 | 10,422 | 8.6 | 18.7 |
| TK4502 | CR | Light Cycle Oil | 146.1 | 957.1 | 0.6 | - | - | - | - | - | - | - | - | - | - | - | 0.6 |
| TK4503 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 1,566.21 | 101.63 | - | - | 0.8 | 762 | 1,158 | 1.0 | 1.8 |
| TK4761 | OPEN | CHEMICALS | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK4762 | OPEN | CHEMICALS | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK4763 | OPEN | CHEMICALS | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK4764 | OPEN | CHEMICALS | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK4765 | OPEN | CHEMICALS | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK6801 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 15,113.92 | 1,868.11 | 7,010.76 | - | 12.0 | 69,424 | 108,748 | 89.1 | 101.1 |
| TK6802 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 15,113.92 | 1,868.11 | 7,010.76 | - | 12.0 | 69,424 | 108,748 | 89.1 | 101.1 |
| TK6803 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 15,113.92 | 1,868.11 | 7,010.76 | - | 12.0 | 69,424 | 108,748 | 89.1 | 101.1 |
| TK6804 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 16,323.87 | 1,601.24 | 7,572.01 | - | 12.7 | 69,603 | 133,907 | 101.8 | 114.5 |
| TK6805 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 16,323.87 | 1,601.24 | 7,572.01 | - | 12.7 | 69,603 | 123,862 | 96.7 | 109.5 |
| TK6806 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 16,323.87 | 1,601.24 | 7,572.01 | - | 12.7 | 69,603 | 133,907 | 101.8 | 114.5 |
| TK6807 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 15,113.92 | 1,868.11 | 7,010.76 | - | 12.0 | 69,603 | 116,910 | 93.3 | 105.3 |
| TK6808 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 15,113.92 | 1,868.11 | 7,010.76 | - | 12.0 | 69,424 | 108,748 | 89.1 | 101.1 |
| TK6809 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 16,323.87 | 1,868.11 | 7,572.01 | - | 12.9 | 69,603 | 133,907 | 101.8 | 114.6 |
| TK6810 | CR | Light Cycle Oil | 71.2 | 466.4 | 0.3 | - | - | - | - | - | - | - | - | - | - | - | 0.3 |
| TK6811 | CR | Light Cycle Oil | 13,231.0 | 64,629.0 | 38.9 | - | - | - | - | - | - | - | - | - | - | - | 38.9 |
| TK6812 | CR | Light Cycle Oil | 13,231.0 | 64,629.0 | 38.9 | - | - | - | - | - | - | - | - | - | - | - | 38.9 |
| TK6813 | CR | Light Cycle Oil | 13,231.0 | 64,629.0 | 38.9 | - | - | - | - | - | - | - | - | - | - | - | 38.9 |
| TK6814 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 16,323.87 | 1,868.11 | 7,572.01 | - | 12.9 | 69,603 | 133,907 | 101.8 | 114.6 |
| TK6815 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 16,323.87 | 1,868.11 | 7,572.01 | - | 12.9 | 69,603 | 133,907 | 101.8 | 114.6 |
| TK6816 | EXT | HN | - | - | - | - | - | - | 17,627.15 | 1,894.65 | 8,176.55 | - | 13.8 | 69,424 | 108,748 | 89.1 | 102.9 |
| TK6817 | CR | Light Cycle Oil | 15,157.0 | 75,400.5 | 45.3 | - | - | - | - | - | - | - | - | - | - | - | 45.3 |
| TK6818 | CR | Light Cycle Oil | 15,157.0 | 75,400.5 | 45.3 | - | - | - | - | - | - | - | - | - | - | - | 45.3 |
| TK6819 | CR | Light Cycle Oil | 15,157.0 | 75,400.5 | 45.3 | - | - | - | - | - | - | - | - | - | - | - | 45.3 |
| TK6820 | CR | Light Cycle Oil | 96.6 | 625.3 | 0.4 | - | - | - | - | - | - | - | - | - | - | - | 0.4 |
| TK6821 | CR | Light Cycle Oil | 2,027.0 | 13,209.4 | 7.6 | - | - | - | - | - | - | - | - | - | - | - | 7.6 |
| TK6822 | CR | Light Cycle Oil | 3,565.7 | 22,970.2 | 13.3 | - | - | - | - | - | - | - | - | - | - | - | 13.3 |
| TK6823 | CR | Light Cycle Oil | 3,565.7 | 22,970.2 | 13.3 | - | - | - | - | - | - | - | - | - | - | - | 13.3 |
| TK6824 | CR | Light Cycle Oil | 3,587.4 | 32,807.2 | 18.2 | - | - | - | - | - | - | - | - | - | - | - | 18.2 |

**Limetree Bay Terminals and Refining**
**B-11 Tanks Annual Potential to Emit**

__Description__: The facility is designed to store multiple petroleum products, chemicals, wastewater and water in 271 tanks, including external floating roof tanks (EXT), internal floating roof tanks (INT), fixed roof tanks (CR and DR) and open tanks.
Tank VOC emissions has been estimated according to AP-42, Chapter 7 Liquid Storage Tanks equations. For purposes of potential to emit the following assumptions were made:

(a) All floating roof tanks were modeled as in Gasoline (RVP 13) service, except TK-6816, TK-6838, TK-6839 and TK-7447, which were modeled at the service established by the MARPOL Project since it resulted in a higher PTE.
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(c) TK-8501 stores pitch. VOC, CO and PM/PM10/PM2.5 emissions were estimated using AP-42 Chapter 7 equations and Chapter 11.1
TK-8501 is subject to NSPS subpart Kb, 60.110b. Per STX-TV-003-10, Condition 3.1.10.1 and 2 the VOC shall not exceed 7.3 tpy and is restricted from storing material with a true vapor pressure greater than 0.5 psia.
(d) All floating roof tank emissions estimates where limited to a maximum true vapor pressure of 11.1 psia (None routed to a control device per §60.112a)
(e) No emissions were estimated for open roof tanks, since these tanks are used for water and/or wastewater with no VOC content storage. Emissions from tanks associated with the WWTP are determine as part of the Wastewater Treatment Plant's emissions.
(f) The tank volume was conservatively used instead of the tank working volume.
(g) A total of 3 turnovers per week (156 turnovers per year) was assumed for each tank.
(h) A total of 10 roof landings per year per tank were used as the basis for landings.
(i) Roof landings were conservatively assumed to be full heel with 3 days in standing idle per event per tank.

**Table 1. Tanks Annual Potential to Emit**

| Tank ID | Tank Type | PTE Material Stored | VERTICAL FIXED ROOF TANKS | | | HORIZONTAL FIXED ROOF TANKS | | | FLOATING ROOF TANKS | | | | | ROOF LANDINGS | | | VOC PTE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Standing Storage Loss | Working Loss | VOC Annual Emissions | Standing Storage Loss | Working Loss | VOC Annual Emissions | Rim Seal Loss | Withdrawal Loss | Deck Fitting Loss | Deck Seam Loss | VOC Annual Emissions | Standing Idle Losses | Filling Losses | VOC Annual Emissions | |
| | | | LS | LW | | LS | LW | | LR | LWD | LF | LD | | LSL | LFL | | |
| | | | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | ton/yr | ton/yr |
| | | | AP-42, Ch. 7.1, Eq. 1-2 | AP-42, Ch. 7.1 Eq. 1-29 | AP-42, Ch. 7.1 Eq. 1-1 | AP-42, Ch. 7.1, Eq. 1-2 | AP-42, Ch. 7.1 Eq. 1-29 | AP-42, Ch. 7.1 Eq. 1-1 | AP-42, Ch. 7.1 Eq. 2-2 | AP-42, Ch. 7.1, Eq. 2-4 | AP-42, Ch. 7.1, Eq. 2-5 | AP-42, Ch. 7.1, Eq. 2-9 | AP-42, Ch. 7.1 Eq. 2-1 | AP-42, Ch. 7.1 Eq. 2-13 or 2-16, 2-19 Eq. 2-23 or 2-20 | AP-42, Ch. 7.1, Eq. 2-26 or 2-27 | AP-42, Ch. 7.1 Eq. 2-10 | |
| | | | (1) | (2) | (3) | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| | | | | | | | | | | | | | | | | | |
| TK6825 | CR | HCN | 16,652.5 | 255,169.3 | 135.9 | - | - | - | - | - | - | - | - | - | - | - | 135.9 |
| TK6831 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 11,666.74 | 514.39 | 7,579.73 | - | 9.9 | 10,161 | 10,726 | 10.4 | 20.3 |
| TK6832 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 10,801.98 | 514.39 | 6,744.53 | - | 9.0 | 7,087 | 10,772 | 8.9 | 18.0 |
| TK6833 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 7,696.75 | 754.99 | 4,392.87 | - | 6.4 | 32,818 | 18,630 | 25.7 | 32.1 |
| TK6834 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 7,696.75 | 754.99 | 4,392.87 | - | 6.4 | 32,818 | 18,630 | 25.7 | 32.1 |
| TK6835 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 7,126.25 | 754.99 | 4,067.27 | - | 6.0 | 32,733 | 13,742 | 23.2 | 29.2 |
| TK6836 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 7,696.75 | 754.99 | 14,468.91 | - | 11.5 | 32,818 | 21,932 | 27.4 | 38.8 |
| TK6837 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 7,126.25 | 754.99 | 15,612.27 | - | 11.7 | 32,733 | 13,742 | 23.2 | 35.0 |
| TK6838 | EXT | Isomerate (Blended with reformate) | - | - | - | - | - | - | 13,849.11 | 1,429.28 | 18,406.74 | - | 16.8 | 53,956 | 58,437 | 56.2 | 73.0 |
| TK6839 | EXT | Isomerate (Blended with reformate) | - | - | - | - | - | - | 13,849.11 | 1,429.28 | 6,609.66 | - | 10.9 | 54,096 | 68,629 | 61.4 | 72.3 |
| TK6840 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 11,746.57 | 1,451.90 | 5,606.20 | - | 9.4 | 53,956 | 58,437 | 56.2 | 65.6 |
| TK6841 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 25,097.74 | 1,539.02 | 25,373.04 | 12,300.83 | 32.2 | 42,852 | 65,135 | 54.0 | 86.1 |
| TK6842 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 7,696.75 | 754.99 | 4,392.87 | - | 6.4 | 32,818 | 18,630 | 25.7 | 32.1 |
| TK6843 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 7,696.75 | 754.99 | 6,103.43 | - | 7.3 | 22,613 | 23,870 | 23.2 | 30.5 |
| TK6851 | CR | Light Cycle Oil | 356.4 | 2,344.9 | 1.4 | - | - | - | - | - | - | - | - | - | - | - | 1.4 |
| TK6852 | CR | Light Cycle Oil | 382.6 | 2,519.3 | 1.5 | - | - | - | - | - | - | - | - | - | - | - | 1.5 |
| TK6853 | CR | Light Cycle Oil | 356.4 | 2,344.9 | 1.4 | - | - | - | - | - | - | - | - | - | - | - | 1.4 |
| TK6854 | CR | Light Cycle Oil | 356.4 | 2,344.9 | 1.4 | - | - | - | - | - | - | - | - | - | - | - | 1.4 |
| TK6856 | OPEN | WATER | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK6857 | OPEN | WATER | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK6858 | CR | Light Cycle Oil | 10,876.7 | 69,320.7 | 40.1 | - | - | - | - | - | - | - | - | - | - | - | 40.1 |
| TK6859 | CR | Light Cycle Oil | 193.1 | 1,277.4 | 0.7 | - | - | - | - | - | - | - | - | - | - | - | 0.7 |
| TK6860 | CR | Light Cycle Oil | 193.1 | 1,277.4 | 0.7 | - | - | - | - | - | - | - | - | - | - | - | 0.7 |
| TK6871 | CR | Light Cycle Oil | 262.7 | 1,337.1 | 0.8 | - | - | - | - | - | - | - | - | - | - | - | 0.8 |
| TK6872 | CR | Light Cycle Oil | 262.7 | 1,337.1 | 0.8 | - | - | - | - | - | - | - | - | - | - | - | 0.8 |
| TK6873 | CR | Light Cycle Oil | 373.7 | 2,457.9 | 1.4 | - | - | - | - | - | - | - | - | - | - | - | 1.4 |
| TK6874 | CR | Light Cycle Oil | 521.5 | 2,673.4 | 1.6 | - | - | - | - | - | - | - | - | - | - | - | 1.6 |
| TK6875 | CR | Light Cycle Oil | 373.7 | 2,457.9 | 1.4 | - | - | - | - | - | - | - | - | - | - | - | 1.4 |
| TK6876 | CR | Light Cycle Oil | 521.5 | 2,673.4 | 1.6 | - | - | - | - | - | - | - | - | - | - | - | 1.6 |
| TK6877 | CR | Light Cycle Oil | 1,213.6 | 6,246.2 | 3.7 | - | - | - | - | - | - | - | - | - | - | - | 3.7 |
| TK6880 | CR | Light Cycle Oil | 122.8 | 1,167.7 | 0.6 | - | - | - | - | - | - | - | - | - | - | - | 0.6 |

**Limetree Bay Terminals and Refining**
**B-11 Tanks Annual Potential to Emit**

__Description__: The facility is designed to store multiple petroleum products, chemicals, wastewater and water in 271 tanks, including external floating roof tanks (EXT), internal floating roof tanks (INT), fixed roof tanks (CR and DR) and open tanks.
Tank VOC emissions has been estimated according to AP-42, Chapter 7 Liquid Storage Tanks equations. For purposes of potential to emit the following assumptions were made:

(a) All floating roof tanks were modeled as in Gasoline (RVP 13) service, except TK-6816, TK-6838, TK-6839 and TK-7447, which were modeled at the service established by the MARPOL Project since it resulted in a higher PTE.
(b) All fixed roof tanks were modeled as in Light Cycle Oil service, except TK-6825, TK-7405, TK-7406, TK-7415, TK-7446, which were modeled in service established by the MARPOL Project since it resulted in a higher PTE.
(c) TK-8501 stores pitch. VOC, CO and PM/PM10/PM2.5 emissions were estimated using AP-42 Chapter 7 equations and Chapter 11.1
TK-8501 is subject to NSPS subpart Kb, 60.110b. Per STX-TV-003-10, Condition 3.1.10.1 and 2 the VOC shall not exceed 7.3 tpy and is restricted from storing material with a true vapor pressure greater than 0.5 psia.
(d) All floating roof tank emissions estimates where limited to a maximum true vapor pressure of 11.1 psia (None routed to a control device per §60.112a)
(e) No emissions were estimated for open roof tanks, since these tanks are used for water and/or wastewater with no VOC content storage. Emissions from tanks associated with the WWTP are determine as part of the Wastewater Treatment Plant's emissions.
(f) The tank volume was conservatively used instead of the tank working volume.
(g) A total of 3 turnovers per week (156 turnovers per year) was assumed for each tank.
(h) A total of 10 roof landings per year per tank were used as the basis for landings.
(i) Roof landings were conservatively assumed to be full heel with 3 days in standing idle per event per tank.

**Table 1. Tanks Annual Potential to Emit**

| Tank ID | Tank Type | PTE Material Stored | VERTICAL FIXED ROOF TANKS | | | HORIZONTAL FIXED ROOF TANKS | | | FLOATING ROOF TANKS | | | | | ROOF LANDINGS | | | VOC PTE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Standing Storage Loss | Working Loss | VOC Annual Emissions | Standing Storage Loss | Working Loss | VOC Annual Emissions | Rim Seal Loss | Withdrawal Loss | Deck Fitting Loss | Deck Seam Loss | VOC Annual Emissions | Standing Idle Losses | Filling Losses | VOC Annual Emissions | |
| | | | LS | LW | | LS | LW | | LR | LWD | LF | LD | | LSL | LFL | | |
| | | | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | ton/yr | ton/yr |
| | | | AP-42, Ch. 7.1, Eq. 1-2 | AP-42, Ch. 7.1 Eq. 1-29 | AP-42, Ch. 7.1 Eq. 1-1 | AP-42, Ch. 7.1, Eq. 1-2 | AP-42, Ch. 7.1 Eq. 1-29 | AP-42, Ch. 7.1 Eq. 1-1 | AP-42, Ch. 7.1 Eq. 2-2 | AP-42, Ch. 7.1, Eq. 2-4 | AP-42, Ch. 7.1, Eq. 2-5 | AP-42, Ch. 7.1, Eq. 2-9 | AP-42, Ch. 7.1 Eq. 2-1 | AP-42, Ch. 7.1 Eq. 2-13 or 2-16, 2-19 Eq. 2-23 or 2-20 | AP-42, Ch. 7.1, Eq. 2-26 or 2-27 | AP-42, Ch. 7.1 Eq. 2-10 | |
| | | | (1) | (2) | (3) | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| | | | | | | | | | | | | | | | | | |
| TK6881 | CR | Light Cycle Oil | 1,213.6 | 6,246.2 | 3.7 | - | - | - | - | - | - | - | - | - | - | - | 3.7 |
| TK6883 | CR | Light Cycle Oil | 188.2 | 1,229.3 | 0.7 | - | - | - | - | - | - | - | - | - | - | - | 0.7 |
| TK6884 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 4,590.19 | 138.28 | 6,080.24 | - | 5.4 | 1,573 | 1,660 | 1.6 | 7.0 |
| TK6887 | CR | Light Cycle Oil | 188.2 | 1,229.3 | 0.7 | - | - | - | - | - | - | - | - | - | - | - | 0.7 |
| TK6888 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 66,133.72 | 138.28 | 6,080.24 | - | 36.2 | 1,573 | 1,660 | 1.6 | 37.8 |
| TK7051 | CR | Light Cycle Oil | 2.7 | 25.3 | 0.01 | - | - | - | - | - | - | - | - | - | - | - | 0.01 |
| TK7201 | CR | Light Cycle Oil | 5.0 | 38.1 | 0.02 | - | - | - | - | - | - | - | - | - | - | - | 0.02 |
| TK7202 | OPEN | WATER | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK7206 | DR | Light Cycle Oil | 281.9 | 1,595.2 | 0.9 | - | - | - | - | - | - | - | - | - | - | - | 0.9 |
| TK7207 | DR | Light Cycle Oil | 281.9 | 1,595.2 | 0.9 | - | - | - | - | - | - | - | - | - | - | - | 0.9 |
| TK7208 | DR | Light Cycle Oil | 281.9 | 1,595.2 | 0.9 | - | - | - | - | - | - | - | - | - | - | - | 0.9 |
| TK7209 | DR | Light Cycle Oil | 281.9 | 1,595.2 | 0.9 | - | - | - | - | - | - | - | - | - | - | - | 0.9 |
| TK7210 | DR | Light Cycle Oil | 281.9 | 1,595.2 | 0.9 | - | - | - | - | - | - | - | - | - | - | - | 0.9 |
| TK7211 | DR | Light Cycle Oil | 281.9 | 1,595.2 | 0.9 | - | - | - | - | - | - | - | - | - | - | - | 0.9 |
| TK7301 | CR | Light Cycle Oil | 6.7 | 62.5 | 0.03 | - | - | - | - | - | - | - | - | - | - | - | 0.03 |
| TK7302 | CR | Light Cycle Oil | 2.1 | 19.7 | 0.01 | - | - | - | - | - | - | - | - | - | - | - | 0.01 |
| TK7401 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 24,020.62 | 2,748.93 | 11,164.81 | - | 19.0 | 102,421 | 293,000 | 197.7 | 216.7 |
| TK7402 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 24,020.62 | 2,748.93 | 11,164.81 | - | 19.0 | 102,421 | 293,000 | 197.7 | 216.7 |
| TK7403 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 24,020.62 | 2,748.93 | 11,164.81 | - | 19.0 | 102,421 | 293,000 | 197.7 | 216.7 |
| TK7404 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 24,020.62 | 2,748.93 | 11,164.81 | - | 19.0 | 102,421 | 311,774 | 207.1 | 226.1 |
| TK7405 | CR | Fuel oil | 32,384.4 | 289,562.1 | 161.0 | - | - | - | - | - | - | - | - | - | - | - | 161.0 |
| TK7406 | CR | Fuel oil | 15,993.7 | 289,562.1 | 152.8 | - | - | - | - | - | - | - | - | - | - | - | 152.8 |
| TK7407 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 24,020.62 | 2,748.93 | 11,164.81 | - | 19.0 | 102,421 | 311,774 | 207.1 | 226.1 |
| TK7408 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 22,240.17 | 2,748.93 | 10,337.26 | - | 17.7 | 102,157 | 264,526 | 183.3 | 201.0 |
| TK7409 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 24,020.62 | 2,748.93 | 37,606.80 | - | 32.2 | 102,421 | 311,774 | 207.1 | 239.3 |
| TK7410 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 24,020.62 | 2,748.93 | 11,164.81 | - | 19.0 | 102,421 | 311,774 | 207.1 | 226.1 |
| TK7411 | CR | Light Cycle Oil | 33,799.3 | 163,266.1 | 98.5 | - | - | - | - | - | - | - | - | - | - | - | 98.5 |
| TK7412 | CR | Light Cycle Oil | 33,799.3 | 163,266.1 | 98.5 | - | - | - | - | - | - | - | - | - | - | - | 98.5 |
| TK7413 | CR | Light Cycle Oil | 15,157.0 | 75,400.5 | 45.3 | - | - | - | - | - | - | - | - | - | - | - | 45.3 |
| TK7414 | CR | Light Cycle Oil | 10,876.7 | 69,320.7 | 40.1 | - | - | - | - | - | - | - | - | - | - | - | 40.1 |
| TK7415 | CR | Fuel oil | 14,546.2 | 133,727.2 | 74.1 | - | - | - | - | - | - | - | - | - | - | - | 74.1 |
| TK7416 | CR | Light Cycle Oil | 15,157.0 | 75,400.5 | 45.3 | - | - | - | - | - | - | - | - | - | - | - | 45.3 |

**Limetree Bay Terminals and Refining**
**B-11 Tanks Annual Potential to Emit**

__Description__: The facility is designed to store multiple petroleum products, chemicals, wastewater and water in 271 tanks, including external floating roof tanks (EXT), internal floating roof tanks (INT), fixed roof tanks (CR and DR) and open tanks.
Tank VOC emissions has been estimated according to AP-42, Chapter 7 Liquid Storage Tanks equations. For purposes of potential to emit the following assumptions were made:

(a) All floating roof tanks were modeled as in Gasoline (RVP 13) service, except TK-6816, TK-6838, TK-6839 and TK-7447, which were modeled at the service established by the MARPOL Project since it resulted in a higher PTE.
(b) All fixed roof tanks were modeled as in Light Cycle Oil service, except TK-6825, TK-7405, TK-7406, TK-7415, TK-7446, which were modeled in service established by the MARPOL Project since it resulted in a higher PTE.
(c) TK-8501 stores pitch. VOC, CO and PM/PM10/PM2.5 emissions were estimated using AP-42 Chapter 7 equations and Chapter 11.1
TK-8501 is subject to NSPS subpart Kb, 60.110b. Per STX-TV-003-10, Condition 3.1.10.1 and 2 the VOC shall not exceed 7.3 tpy and is restricted from storing material with a true vapor pressure greater than 0.5 psia.
(d) All floating roof tank emissions estimates where limited to a maximum true vapor pressure of 11.1 psia (None routed to a control device per §60.112a)
(e) No emissions were estimated for open roof tanks, since these tanks are used for water and/or wastewater with no VOC content storage. Emissions from tanks associated with the WWTP are determine as part of the Wastewater Treatment Plant's emissions.
(f) The tank volume was conservatively used instead of the tank working volume.
(g) A total of 3 turnovers per week (156 turnovers per year) was assumed for each tank.
(h) A total of 10 roof landings per year per tank were used as the basis for landings.
(i) Roof landings were conservatively assumed to be full heel with 3 days in standing idle per event per tank.

**Table 1. Tanks Annual Potential to Emit**

| Tank ID | Tank Type | PTE Material Stored | VERTICAL FIXED ROOF TANKS | | | HORIZONTAL FIXED ROOF TANKS | | | FLOATING ROOF TANKS | | | | | ROOF LANDINGS | | | VOC PTE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Standing Storage Loss | Working Loss | VOC Annual Emissions | Standing Storage Loss | Working Loss | VOC Annual Emissions | Rim Seal Loss | Withdrawal Loss | Deck Fitting Loss | Deck Seam Loss | VOC Annual Emissions | Standing Idle Losses | Filling Losses | VOC Annual Emissions | |
| | | | LS | LW | | LS | LW | | LR | LWD | LF | LD | | LSL | LFL | | |
| | | | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | ton/yr | ton/yr |
| | | | AP-42, Ch. 7.1, Eq. 1-2 | AP-42, Ch. 7.1 Eq. 1-29 | AP-42, Ch. 7.1 Eq. 1-1 | AP-42, Ch. 7.1, Eq. 1-2 | AP-42, Ch. 7.1 Eq. 1-29 | AP-42, Ch. 7.1 Eq. 1-1 | AP-42, Ch. 7.1 Eq. 2-2 | AP-42, Ch. 7.1, Eq. 2-4 | AP-42, Ch. 7.1, Eq. 2-5 | AP-42, Ch. 7.1, Eq. 2-9 | AP-42, Ch. 7.1 Eq. 2-1 | AP-42, Ch. 7.1 Eq. 2-13 or 2-16, 2-19 Eq. 2-23 or 2-20 | AP-42, Ch. 7.1, Eq. 2-26 or 2-27 | AP-42, Ch. 7.1 Eq. 2-10 | |
| | | | (1) | (2) | (3) | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| TK7417 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 162,315.67 | 2,081.06 | 49,204.98 | 21,996.01 | 117.8 | 129,563 | 106,813 | 118.2 | 236.0 |
| TK7418 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 162,315.67 | 2,081.06 | 49,204.98 | 21,996.01 | 117.8 | 129,563 | 106,813 | 118.2 | 236.0 |
| TK7421 | CR | Light Cycle Oil | 10,876.7 | 69,320.7 | 40.1 | - | - | - | - | - | - | - | - | - | - | - | 40.1 |
| TK7422 | CR | Light Cycle Oil | 10,876.7 | 69,320.7 | 40.1 | - | - | - | - | - | - | - | - | - | - | - | 40.1 |
| TK7423 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 16,323.87 | 1,868.11 | 5,153.41 | - | 11.7 | 69,603 | 123,862 | 96.7 | 108.4 |
| TK7424 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 15,113.92 | 1,868.11 | 4,771.43 | - | 10.9 | 69,424 | 108,748 | 89.1 | 100.0 |
| TK7425 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 162,315.67 | 2,081.06 | 49,204.98 | 21,996.01 | 117.8 | 101,715 | 107,372 | 104.5 | 222.3 |
| TK7426 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 162,315.67 | 2,081.06 | 49,204.98 | 21,996.01 | 117.8 | 101,715 | 107,372 | 104.5 | 222.3 |
| TK7427 | CR | Light Cycle Oil | 33,799.3 | 163,266.1 | 98.5 | - | - | - | - | - | - | - | - | - | - | - | 98.5 |
| TK7428 | CR | Light Cycle Oil | 24,257.5 | 150,101.5 | 87.2 | - | - | - | - | - | - | - | - | - | - | - | 87.2 |
| TK7429 | CR | Light Cycle Oil | 33,799.3 | 163,266.1 | 98.5 | - | - | - | - | - | - | - | - | - | - | - | 98.5 |
| TK7430 | CR | Light Cycle Oil | 33,799.3 | 163,266.1 | 98.5 | - | - | - | - | - | - | - | - | - | - | - | 98.5 |
| TK7431 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 7,194.68 | 304.21 | 6,598.08 | 1,009.41 | 7.6 | 3,521 | 5,353 | 4.4 | 12.0 |
| TK7432 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 33,483.09 | 304.21 | 6,598.08 | 1,009.41 | 20.7 | 3,521 | 5,353 | 4.4 | 25.1 |
| TK7433 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | - | 304.21 | 6,598.08 | 1,009.41 | 4.0 | 3,521 | 5,353 | 4.4 | 8.4 |
| TK7434 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | - | 304.21 | 6,598.08 | 1,009.41 | 4.0 | 3,521 | 5,353 | 4.4 | 8.4 |
| TK7435 | CR | Light Cycle Oil | 237.7 | 2,246.7 | 1.2 | - | - | - | - | - | - | - | - | - | - | - | 1.2 |
| TK7436 | CR | Light Cycle Oil | 237.7 | 2,246.7 | 1.2 | - | - | - | - | - | - | - | - | - | - | - | 1.2 |
| TK7437 | CR | Light Cycle Oil | 237.7 | 2,246.7 | 1.2 | - | - | - | - | - | - | - | - | - | - | - | 1.2 |
| TK7438 | CR | Light Cycle Oil | 237.7 | 2,246.7 | 1.2 | - | - | - | - | - | - | - | - | - | - | - | 1.2 |
| TK7439 | CR | Light Cycle Oil | 2,027.0 | 13,209.4 | 7.6 | - | - | - | - | - | - | - | - | - | - | - | 7.6 |
| TK7440 | CR | Light Cycle Oil | 2,027.0 | 13,209.4 | 7.6 | - | - | - | - | - | - | - | - | - | - | - | 7.6 |
| TK7441 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 70,859.56 | 804.77 | 15,109.79 | 4,527.62 | 45.7 | 15,771 | 23,973 | 19.9 | 65.5 |
| TK7443 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 133,591.08 | 1,868.11 | 7,572.01 | - | 71.5 | 69,603 | 123,862 | 96.7 | 168.2 |
| TK7444 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 16,323.87 | 1,868.11 | 7,572.01 | - | 12.9 | 69,603 | 123,862 | 96.7 | 109.6 |
| TK7445 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 16,323.87 | 1,868.11 | 7,572.01 | - | 12.9 | 69,603 | 123,862 | 96.7 | 109.6 |
| TK7446 | CR | SR Diesel | 14,266.7 | 221,724.0 | 118.0 | - | - | - | - | - | - | - | - | - | - | - | 118.0 |
| TK7447 | EXT | Light Naphtha (LN and DNG Purchases blended with Platformate) | - | - | - | - | - | - | 15,816.79 | 1,827.88 | 7,336.79 | - | 12.5 | 69,424 | 108,748 | 89.1 | 101.6 |
| TK7448 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 16,323.87 | 2,081.06 | 41,663.21 | - | 30.0 | 101,715 | 107,372 | 104.5 | 134.6 |
| TK7449 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 16,323.87 | 1,868.11 | 7,572.01 | - | 12.9 | 69,603 | 123,862 | 96.7 | 109.6 |
| TK7451 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 16,444.88 | 804.77 | 16,319.41 | 4,890.93 | 19.2 | 22,613 | 23,870 | 23.2 | 42.5 |

**Limetree Bay Terminals and Refining**
**B-11 Tanks Annual Potential to Emit**

**Description**: The facility is designed to store multiple petroleum products, chemicals, wastewater and water in 271 tanks, including external floating roof tanks (EXT), internal floating roof tanks (INT), fixed roof tanks (CR and DR) and open tanks.
Tank VOC emissions has been estimated according to AP-42, Chapter 7 Liquid Storage Tanks equations. For purposes of potential to emit the following assumptions were made:

(a) All floating roof tanks were modeled as in Gasoline (RVP 13) service, except TK-6816, TK-6838, TK-6839 and TK-7447, which were modeled at the service established by the MARPOL Project since it resulted in a higher PTE.
(b) All fixed roof tanks were modeled as in Light Cycle Oil service, except TK-6825, TK-7405, TK-7406, TK-7415, TK-7446, which were modeled in service established by the MARPOL Project since it resulted in a higher PTE.
(c) TK-8501 stores pitch. VOC, CO and PM/PM10/PM2.5 emissions were estimated using AP-42 Chapter 7 equations and Chapter 11.1
TK-8501 is subject to NSPS subpart Kb, 60.110b. Per STX-TV-003-10, Condition 3.1.10.1 and 2 the VOC shall not exceed 7.3 tpy and is restricted from storing material with a true vapor pressure greater than 0.5 psia.
(d) All floating roof tank emissions estimates where limited to a maximum true vapor pressure of 11.1 psia (None routed to a control device per §60.112a)
(e) No emissions were estimated for open roof tanks, since these tanks are used for water and/or wastewater with no VOC content storage. Emissions from tanks associated with the WWTP are determine as part of the Wastewater Treatment Plant's emissions.
(f) The tank volume was conservatively used instead of the tank working volume.
(g) A total of 3 turnovers per week (156 turnovers per year) was assumed for each tank.
(h) A total of 10 roof landings per year per tank were used as the basis for landings.
(i) Roof landings were conservatively assumed to be full heel with 3 days in standing idle per event per tank.

**Table 1. Tanks Annual Potential to Emit**

| Tank ID | Tank Type | PTE Material Stored | VERTICAL FIXED ROOF TANKS | | | HORIZONTAL FIXED ROOF TANKS | | | FLOATING ROOF TANKS | | | | | ROOF LANDINGS | | | VOC PTE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Standing Storage Loss | Working Loss | VOC Annual Emissions | Standing Storage Loss | Working Loss | VOC Annual Emissions | Rim Seal Loss | Withdrawal Loss | Deck Fitting Loss | Deck Seam Loss | VOC Annual Emissions | Standing Idle Losses | Filling Losses | VOC Annual Emissions | |
| | | | LS | LW | | LS | LW | | LR | LWD | LF | LD | | LSL | LFL | | |
| | | | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | ton/yr | ton/yr |
| | | | AP-42, Ch. 7.1, Eq. 1-2 | AP-42, Ch. 7.1 Eq. 1-29 | AP-42, Ch. 7.1 Eq. 1-1 | AP-42, Ch. 7.1, Eq. 1-2 | AP-42, Ch. 7.1 Eq. 1-29 | AP-42, Ch. 7.1 Eq. 1-1 | AP-42, Ch. 7.1 Eq. 2-2 | AP-42, Ch. 7.1, Eq. 2-4 | AP-42, Ch. 7.1, Eq. 2-5 | AP-42, Ch. 7.1, Eq. 2-9 | AP-42, Ch. 7.1 Eq. 2-1 | AP-42, Ch. 7.1 Eq. 2-13 or 2-16, 2-19 Eq. 2-23 or 2-20 | AP-42, Ch. 7.1, Eq. 2-26 or 2-27 | AP-42, Ch. 7.1 Eq. 2-10 | |
| | | | (1) | (2) | (3) | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| | | | | | | | | | | | | | | | | | |
| TK7452 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 16,444.88 | 804.77 | 16,319.41 | 4,890.93 | 19.2 | 22,613 | 23,870 | 23.2 | 42.5 |
| TK7453 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 16,444.88 | 804.77 | 16,319.41 | 4,890.93 | 19.2 | 22,613 | 23,870 | 23.2 | 42.5 |
| TK7454 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 7,696.75 | 804.77 | 6,103.43 | - | 7.3 | 22,613 | 23,870 | 23.2 | 30.5 |
| TK7455 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 7,696.75 | 754.99 | 4,392.87 | - | 6.4 | 32,818 | 18,630 | 25.7 | 32.1 |
| TK7456 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 7,696.75 | 754.99 | 4,392.87 | - | 6.4 | 32,818 | 18,630 | 25.7 | 32.1 |
| TK7501 | CR | Light Cycle Oil | 15,157.0 | 75,400.5 | 45.3 | - | - | - | - | - | - | - | - | - | - | - | 45.3 |
| TK7502 | CR | Light Cycle Oil | 15,157.0 | 75,400.5 | 45.3 | - | - | - | - | - | - | - | - | - | - | - | 45.3 |
| TK7503 | CR | Light Cycle Oil | 15,157.0 | 75,400.5 | 45.3 | - | - | - | - | - | - | - | - | - | - | - | 45.3 |
| TK7504 | CR | Light Cycle Oil | 15,157.0 | 75,400.5 | 45.3 | - | - | - | - | - | - | - | - | - | - | - | 45.3 |
| TK7505 | CR | Light Cycle Oil | 33,799.3 | 163,266.1 | 98.5 | - | - | - | - | - | - | - | - | - | - | - | 98.5 |
| TK7506 | CR | Light Cycle Oil | 15,447.4 | 137,205.0 | 76.3 | - | - | - | - | - | - | - | - | - | - | - | 76.3 |
| TK7507 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 15,113.92 | 1,868.11 | 17,016.83 | - | 17.0 | 69,424 | 108,748 | 89.1 | 106.1 |
| TK7508 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 15,113.92 | 1,868.11 | 7,010.76 | - | 12.0 | 69,424 | 108,748 | 89.1 | 101.1 |
| TK7509 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 16,323.87 | 1,868.11 | 7,572.01 | - | 12.9 | 69,603 | 123,862 | 96.7 | 109.6 |
| TK7510 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 22,240.17 | 2,748.93 | 16,560.30 | - | 20.8 | 102,157 | 264,526 | 183.3 | 204.1 |
| TK7511 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 24,020.62 | 2,748.93 | 21,971.92 | - | 24.4 | 102,421 | 311,774 | 207.1 | 231.5 |
| TK7512 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 24,020.62 | 2,748.93 | 17,886.05 | - | 22.3 | 102,421 | 311,774 | 207.1 | 229.4 |
| TK7513 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 24,020.62 | 2,748.93 | 7,078.93 | - | 16.9 | 102,421 | 311,774 | 207.1 | 224.0 |
| TK7514 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 24,020.62 | 2,748.93 | 21,971.92 | - | 24.4 | 102,421 | 311,774 | 207.1 | 231.5 |
| TK7515 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 22,240.17 | 2,748.93 | 20,343.33 | - | 22.7 | 102,157 | 264,526 | 183.3 | 206.0 |
| TK7516 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 24,020.62 | 2,748.93 | 11,164.81 | - | 19.0 | 102,421 | 311,774 | 207.1 | 226.1 |
| TK7517 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 24,020.62 | 2,748.93 | 7,078.93 | - | 16.9 | 102,421 | 293,000 | 197.7 | 214.6 |
| TK7521 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 7,589.95 | 304.73 | 7,126.30 | 1,041.34 | 8.0 | 4,817 | 5,085 | 5.0 | 13.0 |
| TK7522 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 7,589.95 | 304.73 | 7,126.30 | 1,041.34 | 8.0 | 4,817 | 5,085 | 5.0 | 13.0 |
| TK7523 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 7,589.95 | 304.73 | 7,126.30 | 1,041.34 | 8.0 | 4,817 | 5,085 | 5.0 | 13.0 |
| TK7524 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | - | 304.73 | 7,126.30 | 1,041.34 | 4.2 | 4,817 | 5,085 | 5.0 | 9.2 |
| TK7525 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | - | 304.73 | 7,126.30 | 1,041.34 | 4.2 | 4,817 | 5,085 | 5.0 | 9.2 |
| TK7526 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | - | 304.73 | 7,126.30 | 1,041.34 | 4.2 | 4,817 | 5,085 | 5.0 | 9.2 |
| TK7528 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 15,058.64 | 796.47 | 15,062.92 | 4,427.46 | 17.7 | 15,427 | 23,449 | 19.4 | 37.1 |
| TK7541 | CR | Light Cycle Oil | 8.8 | 82.1 | 0.05 | - | - | - | - | - | - | - | - | - | - | - | 0.05 |
| TK7542 | CR | Light Cycle Oil | 1.2 | 10.9 | 0.01 | - | - | - | - | - | - | - | - | - | - | - | 0.01 |
| TK7571 | CR | Light Cycle Oil | 5.9 | 54.7 | 0.03 | - | - | - | - | - | - | - | - | - | - | - | 0.03 |

**Limetree Bay Terminals and Refining**
**B-11 Tanks Annual Potential to Emit**

<u>Description</u>: The facility is designed to store multiple petroleum products, chemicals, wastewater and water in 271 tanks, including external floating roof tanks (EXT), internal floating roof tanks (INT), fixed roof tanks (CR and DR) and open tanks.
Tank VOC emissions has been estimated according to AP-42, Chapter 7 Liquid Storage Tanks equations. For purposes of potential to emit the following assumptions were made:

(a) All floating roof tanks were modeled as in Gasoline (RVP 13) service, except TK-6816, TK-6838, TK-6839 and TK-7447, which were modeled at the service established by the MARPOL Project since it resulted in a higher PTE.
(b) All fixed roof tanks were modeled as in Light Cycle Oil service, except TK-6825, TK-7405, TK-7406, TK-7415, TK-7446, which were modeled in service established by the MARPOL Project since it resulted in a higher PTE.
(c) TK-8501 stores pitch. VOC, CO and PM/PM10/PM2.5 emissions were estimated using AP-42 Chapter 7 equations and Chapter 11.1
TK-8501 is subject to NSPS subpart Kb, 60.110b. Per STX-TV-003-10, Condition 3.1.10.1 and 2 the VOC shall not exceed 7.3 tpy and is restricted from storing material with a true vapor pressure greater than 0.5 psia.
(d) All floating roof tank emissions estimates where limited to a maximum true vapor pressure of 11.1 psia (None routed to a control device per §60.112a)
(e) No emissions were estimated for open roof tanks, since these tanks are used for water and/or wastewater with no VOC content storage. Emissions from tanks associated with the WWTP are determine as part of the Wastewater Treatment Plant's emissions.
(f) The tank volume was conservatively used instead of the tank working volume.
(g) A total of 3 turnovers per week (156 turnovers per year) was assumed for each tank.
(h) A total of 10 roof landings per year per tank were used as the basis for landings.
(i) Roof landings were conservatively assumed to be full heel with 3 days in standing idle per event per tank.

**Table 1. Tanks Annual Potential to Emit**

| Tank ID | Tank Type | PTE Material Stored | VERTICAL FIXED ROOF TANKS | | | HORIZONTAL FIXED ROOF TANKS | | | FLOATING ROOF TANKS | | | | | ROOF LANDINGS | | | VOC PTE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Standing Storage Loss | Working Loss | VOC Annual Emissions | Standing Storage Loss | Working Loss | VOC Annual Emissions | Rim Seal Loss | Withdrawal Loss | Deck Fitting Loss | Deck Seam Loss | VOC Annual Emissions | Standing Idle Losses | Filling Losses | VOC Annual Emissions | |
| | | | LS | LW | | LS | LW | | LR | LWD | LF | LD | | LSL | LFL | | |
| | | | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | ton/yr | ton/yr |
| | | | AP-42, Ch. 7.1, Eq. 1-2 | AP-42, Ch. 7.1 Eq. 1-29 | AP-42, Ch. 7.1 Eq. 1-1 | AP-42, Ch. 7.1, Eq. 1-2 | AP-42, Ch. 7.1 Eq. 1-29 | AP-42, Ch. 7.1 Eq. 1-1 | AP-42, Ch. 7.1 Eq. 2-2 | AP-42, Ch. 7.1, Eq. 2-4 | AP-42, Ch. 7.1, Eq. 2-5 | AP-42, Ch. 7.1, Eq. 2-9 | AP-42, Ch. 7.1 Eq. 2-1 | AP-42, Ch. 7.1 Eq. 2-13 or 2-16, 2-19 Eq. 2-23 or 2-20 | AP-42, Ch. 7.1, Eq. 2-26 or 2-27 | AP-42, Ch. 7.1 Eq. 2-10 | |
| | | | (1) | (2) | (3) | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| | | | | | | | | | | | | | | | | | |
| TK7601 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 16,577.61 | 2,599.94 | 41,996.44 | - | 30.6 | 104,901 | 110,736 | 107.8 | 138.4 |
| TK7602 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 15,348.85 | 2,599.94 | 38,883.59 | - | 28.4 | 73,165 | 111,210 | 92.2 | 120.6 |
| TK7603 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 16,577.61 | 2,599.94 | 41,996.44 | - | 30.6 | 104,901 | 110,736 | 107.8 | 138.4 |
| TK7604 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 37,486.56 | 2,599.94 | 41,996.44 | - | 41.0 | 104,901 | 110,736 | 107.8 | 148.9 |
| TK7605 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 125,611.72 | 2,168.17 | 21,063.34 | - | 74.4 | 70,503 | 112,816 | 91.7 | 166.1 |
| TK7931 | OPEN | WATER | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK7932 | OPEN | PROCESS TANK | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK7933 | CR | Light Cycle Oil | 245.9 | 1,595.2 | 0.9 | - | - | - | - | - | - | - | - | - | - | - | 0.9 |
| TK7934 | CR | Light Cycle Oil | 215.1 | 2,041.3 | 1.1 | - | - | - | - | - | - | - | - | - | - | - | 1.1 |
| TK7943 | CR | Light Cycle Oil | 5.7 | 53.6 | 0.0 | - | - | - | - | - | - | - | - | - | - | - | 0.03 |
| TK7951 | OPEN | WASTEWATER | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK7955 | OPEN | WATER | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK7956 | CR | Light Cycle Oil | 51.4 | 466.6 | 0.3 | - | - | - | - | - | - | - | - | - | - | - | 0.3 |
| TK7966 | CR (with Carbon Canisters) | Light Cycle Oil | 576.9 | 3,876.2 | 2.2 | - | - | - | - | - | - | - | - | - | - | - | 2.2 |
| TK7971 | OPEN | WASTEWATER | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK7973 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 8,457.96 | 691.38 | - | - | 4.6 | 36,064 | 24,328 | 30.2 | 34.8 |
| TK7974 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 455.93 | 52.54 | - | - | 0.3 | 614 | 649 | 0.6 | 0.9 |
| TKS-7974 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | - | 88.15 | - | - | 0.0 | 10,819 | 2,594 | 6.7 | 6.8 |
| TK7975 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | 9,562.90 | 176.30 | - | - | 4.9 | 18,032 | 1,452 | 9.7 | 14.6 |
| TKS-7975 | EXT | Gasoline (RVP 13) | - | - | - | - | - | - | - | 73.46 | - | - | 0.0 | 9,016 | 1,802 | 5.4 | 5.4 |
| TK7976 | FLAT | Light Cycle Oil | 2.0 | 12.8 | 0.01 | - | - | - | - | - | - | - | - | - | - | - | 0.01 |
| TK7977 | OPEN | WASTEWATER | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK7978A | OPEN | WASTEWATER | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK7978B | OPEN | WASTEWATER | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK7979A | OPEN | WASTEWATER | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK7979B | OPEN | WASTEWATER | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK7981 | OPEN | WASTEWATER | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK7982 | OPEN | CHEMICALS | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK7983 | OPEN | WASTEWATER | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK7984 | OPEN | WASTEWATER | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK7986 | FLAT(SUMP?) | Light Cycle Oil | 2.7 | 25.3 | 0.01 | - | - | - | - | - | - | - | - | - | - | - | 0.01 |

**Limetree Bay Terminals and Refining**
**B-11 Tanks Annual Potential to Emit**

__Description__: The facility is designed to store multiple petroleum products, chemicals, wastewater and water in 271 tanks, including external floating roof tanks (EXT), internal floating roof tanks (INT), fixed roof tanks (CR and DR) and open tanks.
Tank VOC emissions has been estimated according to AP-42, Chapter 7 Liquid Storage Tanks equations. For purposes of potential to emit the following assumptions were made:
(a) All floating roof tanks were modeled as in Gasoline (RVP 13) service, except TK-6816, TK-6838, TK-6839 and TK-7447, which were modeled at the service established by the MARPOL Project since it resulted in a higher PTE.
(b) All fixed roof tanks were modeled as in Light Cycle Oil service, except TK-6825, TK-7405, TK-7406, TK-7415, TK-7446, which were modeled in service established by the MARPOL Project since it resulted in a higher PTE.
(c) TK-8501 stores pitch. VOC, CO and PM/PM10/PM2.5 emissions were estimated using AP-42 Chapter 7 equations and Chapter 11.1
TK-8501 is subject to NSPS subpart Kb, 60.110b. Per STX-TV-003-10, Condition 3.1.10.1 and 2 the VOC shall not exceed 7.3 tpy and is restricted from storing material with a true vapor pressure greater than 0.5 psia.
(d) All floating roof tank emissions estimates where limited to a maximum true vapor pressure of 11.1 psia (None routed to a control device per §60.112a)
(e) No emissions were estimated for open roof tanks, since these tanks are used for water and/or wastewater with no VOC content storage. Emissions from tanks associated with the WWTP are determine as part of the Wastewater Treatment Plant's emissions.
(f) The tank volume was conservatively used instead of the tank working volume.
(g) A total of 3 turnovers per week (156 turnovers per year) was assumed for each tank.
(h) A total of 10 roof landings per year per tank were used as the basis for landings.
(i) Roof landings were conservatively assumed to be full heel with 3 days in standing idle per event per tank.

**Table 1. Tanks Annual Potential to Emit**

| Tank ID | Tank Type | PTE Material Stored | VERTICAL FIXED ROOF TANKS | | | HORIZONTAL FIXED ROOF TANKS | | | FLOATING ROOF TANKS | | | | | ROOF LANDINGS | | | VOC PTE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Standing Storage Loss | Working Loss | VOC Annual Emissions | Standing Storage Loss | Working Loss | VOC Annual Emissions | Rim Seal Loss | Withdrawal Loss | Deck Fitting Loss | Deck Seam Loss | VOC Annual Emissions | Standing Idle Losses | Filling Losses | VOC Annual Emissions | |
| | | | LS | LW | | LS | LW | | LR | LWD | LF | LD | | LSL | LFL | | |
| | | | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | ton/yr | ton/yr |
| | | | AP-42, Ch. 7.1, Eq. 1-2 | AP-42, Ch. 7.1 Eq. 1-29 | AP-42, Ch. 7.1 Eq. 1-1 | AP-42, Ch. 7.1, Eq. 1-2 | AP-42, Ch. 7.1 Eq. 1-29 | AP-42, Ch. 7.1 Eq. 1-1 | AP-42, Ch. 7.1 Eq. 2-2 | AP-42, Ch. 7.1, Eq. 2-4 | AP-42, Ch. 7.1, Eq. 2-5 | AP-42, Ch. 7.1, Eq. 2-9 | AP-42, Ch. 7.1 Eq. 2-1 | AP-42, Ch. 7.1 Eq. 2-13 or 2-16, 2-19 Eq. 2-23 or 2-20 | AP-42, Ch. 7.1, Eq. 2-26 or 2-27 | AP-42, Ch. 7.1 Eq. 2-10 | |
| | | | (1) | (2) | (3) | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |
| TK7987 | OPEN | WASTEWATER | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK7988 | OPEN | WASTEWATER | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK8001 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 743.95 | 27.22 | - | - | 0.4 | 172 | 261 | 0.2 | 0.6 |
| TK8002 | INT | Gasoline (RVP 13) | - | - | - | - | - | - | 743.95 | 29.04 | - | - | 0.4 | 172 | 261 | 0.2 | 0.6 |
| TK8501 | DR | PITCH | 113.0 | 1,480.3 | 0.8 | - | - | - | - | - | - | - | - | - | - | - | 0.8 |
| TK8502 | OPEN | WATER | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| TK8503 | DR | Light Cycle Oil | 26.6 | 214.3 | 0.1 | - | - | - | - | - | - | - | - | - | - | - | 0.1 |
| TK8505 | FLAT | Light Cycle Oil | 0.4 | 3.4 | 0.002 | - | - | - | - | - | - | - | - | - | - | - | 0.00 |
| TK8508 | HFR | Light Cycle Oil | - | - | - | 11.3 | 106.3 | 0.1 | - | - | - | - | - | - | - | - | 0.1 |
| TK8511 | CR | Light Cycle Oil | 36.6 | 234.5 | 0.1 | - | - | - | - | - | - | - | - | - | - | - | 0.1 |
| TK8701 | CR | Light Cycle Oil | 147.4 | 1,352.6 | 0.8 | - | - | - | - | - | - | - | - | - | - | - | 0.8 |
| TKUTT1 | CR | Light Cycle Oil | 391.5 | 2,573.5 | 1.5 | - | - | - | - | - | - | - | - | - | - | - | 1.5 |
| TKD-290 (frmly D1301) | HFR | Light Cycle Oil | - | - | - | 25.6 | 130.1 | 0.1 | - | - | - | - | - | - | - | - | 0.1 |
| TKD-1609 | HFR | Light Cycle Oil | - | - | - | 36.2 | 175.0 | 0.1 | - | - | - | - | - | - | - | - | 0.1 |
| TKD-1610 | HFR | Light Cycle Oil | - | - | - | 36.2 | 175.0 | 0.1 | - | - | - | - | - | - | - | - | 0.1 |

## Limetree Bay Terminals and Refining
## B-11 Tanks Annual Potential to Emit

__Description__: The facility is designed to store multiple petroleum products, chemicals, wastewater and water in 271 tanks, including external floating roof tanks (EXT), internal floating roof tanks (INT), fixed roof tanks (CR and DR) and open tanks.
Tank VOC emissions has been estimated according to AP-42, Chapter 7 Liquid Storage Tanks equations. For purposes of potential to emit the following assumptions were made:

(a) All floating roof tanks were modeled as in Gasoline (RVP 13) service, except TK-6816, TK-6838, TK-6839 and TK-7447, which were modeled at the service established by the MARPOL Project since it resulted in a higher PTE.
(b) All fixed roof tanks were modeled as in Light Cycle Oil service, except TK-6825, TK-7405, TK-7406, TK-7415, TK-7446, which were modeled in service established by the MARPOL Project since it resulted in a higher PTE.
(c) TK-8501 stores pitch. VOC, CO and PM/PM10/PM2.5 emissions were estimated using AP-42 Chapter 7 equations and Chapter 11.1
TK-8501 is subject to NSPS subpart Kb, 60.110b. Per STX-TV-003-10, Condition 3.1.10.1 and 2 the VOC shall not exceed 7.3 tpy and is restricted from storing material with a true vapor pressure greater than 0.5 psia.
(d) All floating roof tank emissions estimates where limited to a maximum true vapor pressure of 11.1 psia (None routed to a control device per §60.112a)
(e) No emissions were estimated for open roof tanks, since these tanks are used for water and/or wastewater with no VOC content storage. Emissions from tanks associated with the WWTP are determine as part of the Wastewater Treatment Plant's emissions.
(f) The tank volume was conservatively used instead of the tank working volume.
(g) A total of 3 turnovers per week (156 turnovers per year) was assumed for each tank.
(h) A total of 10 roof landings per year per tank were used as the basis for landings.
(i) Roof landings were conservatively assumed to be full heel with 3 days in standing idle per event per tank.

### Table 1. Tanks Annual Potential to Emit

| Tank ID | Tank Type | PTE Material Stored | VERTICAL FIXED ROOF TANKS | | | HORIZONTAL FIXED ROOF TANKS | | | FLOATING ROOF TANKS | | | | | ROOF LANDINGS | | | VOC PTE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Standing Storage Loss | Working Loss | VOC Annual Emissions | Standing Storage Loss | Working Loss | VOC Annual Emissions | Rim Seal Loss | Withdrawal Loss | Deck Fitting Loss | Deck Seam Loss | VOC Annual Emissions | Standing Idle Losses | Filling Losses | VOC Annual Emissions | |
| | | | LS | LW | | LS | LW | | LR | LWD | LF | LD | | LSL | LFL | | |
| | | | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | lb/yr | lb/yr | ton/yr | lb/yr | lb/yr | ton/yr | ton/yr |
| | | | AP-42, Ch. 7.1, Eq. 1-2 | AP-42, Ch. 7.1 Eq. 1-29 | AP-42, Ch. 7.1 Eq. 1-1 | AP-42, Ch. 7.1, Eq. 1-2 | AP-42, Ch. 7.1 Eq. 1-29 | AP-42, Ch. 7.1 Eq. 1-1 | AP-42, Ch. 7.1 Eq. 2-2 | AP-42, Ch. 7.1, Eq. 2-4 | AP-42, Ch. 7.1, Eq. 2-5 | AP-42, Ch. 7.1, Eq. 2-9 | AP-42, Ch. 7.1 Eq. 2-1 | AP-42, Ch. 7.1 Eq. 2-13 or 2-16, 2-19 Eq. 2-23 or 2-20 | AP-42, Ch. 7.1, Eq. 2-26 or 2-27 | AP-42, Ch. 7.1 Eq. 2-10 | |
| | | | (1) | (2) | (3) | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) |

__Notes:__
(1) $L_S$ = Standing Storage Loss per AP-42, Ch. 7.1, Eq. 1-2. Refer to "VFR Tanks Losses" or "HFR Tanks Losses" for detailed calculations
(2) $L_W$ = Working Loss per AP-42, Ch. 7.1, Eq. 1-29. Refer to "VFR Tanks Losses" or "HFR Tanks Losses" for detailed calculations
(3) VOC Annual Emissions sum of standing storage losses and working losses per AP-42, Ch. 7.1, Eq. 1-1

Eq. 1-1 $$\text{VOC}\ (ton/yr) = [L_S\ (lb/yr) + L_W\ (lb/yr)] \cdot 1\ ton/2{,}000\ lb$$

(4) $L_R$ = Rim Seal Loss per AP-42, Ch. 7.1, Eq. 2-2. Refer to "IFR & EFR Tanks Losses" for detailed calculations
(5) $L_{WD}$ = Withdrawal Loss per AP-42, Ch. 7.1, Eq. 2-4. Refer to "IFR & EFR TanksLosses" for detailed calculations
(6) $L_F$ = Deck Fitting Loss per AP-42, Ch. 7.1, Eq. 2-5. Refer to "IFR & EFR Tanks Losses" for detailed calculations
(7) $L_D$ = Deck Seam Loss per AP-42, Ch. 7.1, Eq. 2-9 for IFR tanks only. Refer to "IFR & EFR Tanks Losses" for detailed calculations
(8) VOC Annual Emissions sum of rim seal losses, withdrawal losses, deck fitting losses and deck seam losses per AP-42, Ch. 7.1, Eq. 2-1

Eq. 2-1 $$\text{VOC}\ (ton/yr) = [L_R(lb/yr) + L_{WD}(lb/yr) + L_F(lb/yr) + L_D(lb/yr)] \cdot 1\ ton/2{,}000\ lb$$

(9) $L_{SL}$ = Standing Idle Losses per AP-42, Ch. 7.1, Eq. 2-13 or 2-16, 2-19 and Eq. 2-23 or 2-20. Refer to "IFR & EFR Landing Losses" for detailed calculations
(10) $L_{FL}$ = Filling losses for IFR landings and for EFR Drain Dry landings per AP-42, Ch. 7.1, Eq. 2-26 and for EFR roof landings with a liquid heel (partial/full) per Eq. 2-27. Refer to "IFR & EFR Landing Losses" for detailed calculations
(11) VOC Annual Emissions sum of standing idle losses and filling lossses losses per AP-42, Ch. 7.1, Eq. 2-10

Eq. 2-10 $$\text{VOC}\ (ton/yr) = [L_{SL}(lb/yr) + L_{FL}(lb/yr)] \cdot 1\ ton/2{,}000\ lb$$

(12) Total emissions:
- For Vertical Fixed Roof Tanks and Horizontal Fixed Roof Tanks per AP-42, Ch. 7.1, Eq. 1-1 = sum of standing storage losses and working losses
- For Floating Roof Tanks per AP-42, Ch. 7.1, Eq. 2-1 for nornal operations = sum of rim seal losses, withdrawl losses, deck fitting losses, and deck seam losses. Plus Eq. 2-10 for roof landing losses = Standing idle losses plus filling losses.

(15) TK8501 VOC, CO and PM/PM10/PM2.5 emissions calculated according to AP-42, Chapter 7.1 and Chapter 11.1

| TK8501 | Annual PTE (tpy) |
|---|---|
| VOC | 0.8 |
| CO | 0.077 |
| PM | 0.078 |
| PM10 | 0.078 |
| PM2.5 | 0.078 |

## Limetree Bay Terminals and Refining
## B-12 Platformer Catalyst Regenerators Vents Annual Potential to Emit

### Table 1. Platformer Regenerators Vents Annual Potential to Emit

| Unit | Unit Capacity (MBPD) | Annual Potential to Emit (tpy)[(1),(2)] | | |
|---|---|---|---|---|
| | | SO2 | CO | VOC |
| 2 PLAT /2 HYDROBON | 25 | 0.3 | 2.2 | 1.1 |
| 3 PLAT / 3 HYDROBON | 45 | 0.6 | 3.9 | 2.0 |
| 4 PLAT / 4 HYDROBON | 45 | 0.6 | 3.9 | 2.0 |

Notes:

(1) SO2 and CO PTE (tpy) = Default Emission Factor (lb/hr) * Unit Capacity (MBPD)/7.5 MBPD * 8760 hr/yr * 1 ton/2,000 lb

Example: 2 PLAT/2 HYDROBON SO2 = 0.022 lb/hr * 25 MBPD/7.5 MBPD * 8760 hr/yr * 1 ton/2,000 lb = 0.3 tpy

(2) VOC PTE (tpy) = Default Emission Factor (lb/MBBL) * Unit Capacity (MBPD) * 365 days/yr * 1 ton/2,000 lb

Example: 2 PLAT/2 HYDROBON VOC = 0.24 lb/MBBL * 25 MBPD * 365 days/yr * 1 ton/2,000 lb = 1.1 tpy

### Table 2. Default Emission Factors

| | | |
|---|---|---|
| SO2 | 0.022 | lb/hr for a 7500 BPD regenerator |
| CO | 0.15 | lb/hr for a 7500 BPD regenerator |
| VOC | 0.24 | lb/10^3 bbl |

Notes:

(1) Emission factors for SO2 and CO correspond to emissions from a 7500 BPD regenerator from EPA ICR

(2) Emission factors for VOC per Table 5-6 of the Emissions Estimation Protocol for Petroleum Refineriers, April 2015

**Limetree Bay Terminals and Refining**
**B-13 Sulfuric Acid Plant (SAP) Annual Potential to Emit**

### Table 1. Sulfuric Acid Stack Annual Potential to Emit

| Parameter | STX-TV-003-10 Condition | Sulfuric Acid Plant Stack (STK-7802) | | | | |
|---|---|---|---|---|---|---|
| | | ton/day | lb/ton | ppmvd @ 7% O2 | lb/hr | tpy |
| SAP Production Rate | 3.2.18.1 | 320 | | | | |
| SO2 | 3.2.18.2 and 3.2.18.3 | | 4.0 | 375.0 | 45.8 | 201.0 |
| NOx (as NO2) | 3.2.18.4 | | | 200.0 | 12.2 | 53.4 |
| H2SO4 and SO3 (as defined by NSPS) | 3.2.18.5 | | 0.15 | | 2.0 | 8.8 |
| Startup | 3.2.18.7 | 8 times per year (on a 365-day rolling average) the SAP is exempt for the SO2 hourly mass emission limit and the SO2 concentration limit for a maximum of 4 hours during startup of the unit | | | | |

**Limetree Bay Terminals and Refining**
**B-14 Coker Steam Vent Annual Potential to Emit**

**Description**: The Coker converts, via thermal cracking, residual oil (pitch) from #1 VAC and #3 VAC into gas oil for further refining. The residual oil is baked in a coke drum at a hight temperature (935°F). The volatile constituents are directed out the top of the coke drum to a frantionation column. The remaining solid pet coke is deposited i the drum over a porous structure. Once filled, the coke drum is first teamed to further recover volatile hydrocarbons and then it is water-quenced to lower the temperature of the pet coke. Following the water quench the coker steam vent (12-inch vent) depressurizes the coke drum to atmospheric pressure. Emissions are estimated using actual sampling data conducted at the facility in 2008.

**Table 1. Coker Vent Annual Potential to Emit**

| Parameter | Units | SO2 | CO | PM | PM10 | PM2.5 | VOC |
|---|---|---|---|---|---|---|---|
| Mass Emissions(1) | lb/cycle | 2.8 | 2.0 | 32.9 | 32.9 | 32.9 | 138.4 |
| Potential to Emit(2) | tpy | 1.3 | 0.9 | 14.8 | 14.8 | 14.8 | 62.4 |

Notes:
(1) Mass emissions (lb/cycle) from Source Test Report of the Coke Steam Vent, URS 40942073, September 8, 2008.
- VOC and PM adjusted for CD Compliance with 2 psig coker steam vent depressurization standard
- CO - Average ppmvd of test report data: Shell, Chevron, Conoco-Phillips, and Exxon-Mobil

(2) Potential to Emit (tpy) = Mass Emissions (lb/cycle) * No. Venting Events per Year (cycle/yr) * 1 ton/2,000 lb
Example: CO Potential to Emit = 2.0 lb/cycle * 902 cycle/yr * 1 ton/2,000 lb = 0.9 tpy

**Table 2. Vent Characteristics**

| Calendar Year | Coker Charge (MBPD) | Vent Episodes | Vents/MBPD |
|---|---|---|---|
| 2009 | 47.3 | 746.0 | 15.8 |
| 2010 | 45.4 | 696.0 | 15.3 |
| Title V #3.1.17.7 | 58.0 | 902.0 | |

Notes:
(1) Title V, Condition 3.1.17.7: The charge rate to the coker shall not exceed 21,170,000 barrels on a 365 day rolling average
Example: Vent Episodes at Title V Coker Charge Rate = 21,170,000 bbl/yr * 1yr/365 days * 1 Mbbl/1,000 bbl * 15.6 vents/MBPD = 902.0 vent episodes

## Limetree Bay Terminals and Refining
## B-15 Coker Heaters (H-8501A & B) Air-Steam Decoking Annual Potential to Emit

**Table 1. Coker Heaters Air-Steam Decoking Emissions (per heater)**

| Parameter | Units | NOx | CO | VOC | PM | PM10 | PM2.5 | SO2 | H2SO4 | Lead |
|---|---|---|---|---|---|---|---|---|---|---|
| Emission Factor[(1)] | lb/ton | 22.0 | 0.5 | 0.06 | 10.0 | 2.30 | 0.60 | 228.0 | 2.06 | 0.013 |
| Coke Burning and Spalling Emissions per Heater [(2),(3),(4)] | tpy | 0.04 | 0.001 | 1.2E-04 | 4.02 | 0.005 | 0.001 | 0.5 | 0.004 | 2.6E-05 |

Notes:

(1) Emission factors for uncontrolled, PC, dry bottom, wall-fired, bituminous coal firing, per AP-42, Chapter 1.1, tables: .1-3 (Pre-NSPS, SOx, NOx, CO), 1.1-4 (PM, PM10), 1.1-6 (PM10, PM2.5), 1.1-19 (TNMOC), 1.1-17 (Lead). Where:

| | | |
|---|---|---|
| Coke sulfur content = | 6.0 | %wt (assumed typically 4 to 6% wt) |
| Coke ash content = | 1.0 | %wt (assumed, typically < 1% wt) |
| H2SO4 = | 0.343 * wt%S | 0.7% conversion to SO3 and 95% conversion to H2SO4 |
| Unit Conversion = | 26.0 | MMBtu/ton, unit conversion lb/ton to lb/MMBtu (AP-42, Chapter 1.1, Section 1.1.5) |

(2) Decoking Cycles

| | | |
|---|---|---|
| No. Decoking Cycles per Year | 1.0 | cycle/yr per heater |
| Coke Removed per Cycle = | 8,000 | lb/cycle (worst case 5,000 lbs ± 3,000 lbs, two heaters) |
| Coke Burned per Cycle = | 8,000 | lb/cycle |
| Coke Spalled per Cycle = | 8,000 | lb/cycle |

(3) Annual Emissions ($ton_{pollutant}$/yr) = Emission Factor ($lb_{pollutant}/ton_{coke}$) * Coke Burned per Cycle ($lb_{coke}$/cycle) * 1 $ton_{pollutant}$/2,000 $lb_{pollutant}$ * 1 $ton_{coke}$/2,000 $lb_{coke}$

Example: NOx Annual Emissions = 22 lb/ton * 8,000 lb/cycle * 1ton/2,000 lb * 1 ton/2,000 lb = 0.04 tpy

(4) PM annual emissions include coke burning and spalling.

Annual Emissions ($ton_{pollutant}$/yr) = [Emission Factor ($lb_{pollutant}/ton_{coke}$) * Coke Burned per Cycle ($lb_{coke}$/cycle) * 1 $ton_{pollutant}$/2,000 $lb_{pollutant}$ * 1 $ton_{coke}$/2,000 $lb_{coke}$]
+ [ No. Decoking Cycle /yr * Coke Spalled per Cycle (lb/cycle) * 1 ton/2,000 lb]

Example: PM Annual Emissions = [10 lb/ton * 8,000 lb/cycle * 1ton/2,000 lb * 1 ton/2,000 lb] + [ 1 cycles/yr * 8,000 lb/cyle * 1 ton/2,000 lb] = 4.0 tpy

## Limetree Bay Terminals and Refining
## B-16 Fugitives Annual Potential to Emit

**Table 1. Fugitive Equipment Leak Annual Potential to Emit**

| Unit | Area | Total Monitored Components Count (All Services) | Total Unmonitored Components Count (All Services) | Annual Potential to Emit (tpy) | |
|---|---|---|---|---|---|
| | | | | VOC | Non-VOC |
| 2 CDU | Area 1 | 2,871 | 3,677 | 22.5 | 0.4 |
| 3 CDU / 1 VAC | Area 1 | 2,399 | 4,391 | 22.4 | 4.6 |
| 5 CDU | Area 3 | 5,552 | 7,532 | 40.1 | 13.2 |
| 6 CDU | Area 3 | 5,924 | 7,936 | 44.7 | 13.2 |
| 2 VAC | Area 2 | 345 | 3,723 | 13.4 | 4.8 |
| 3 VAC | Area 4 | 1,168 | 5,513 | 23.3 | 4.2 |
| 1 VIS (2 DU FRAC) | Area 1 | 1,513 | 3,433 | 19.0 | 2.1 |
| 2 VIS | Area 2 | 1,356 | 1,573 | 11.4 | 2.2 |
| 2 DD | Area 2 | 4,501 | 3,144 | 32.3 | 4.8 |
| 3 DD | Area 1 | 1,975 | 1,678 | 14.5 | 1.9 |
| 4 DD | Area 2 | 3,652 | 4,508 | 26.1 | 8.4 |
| 5 DD | Area 2 | 678 | 1,932 | 10.1 | 2.1 |
| 6 DD | Area 4 | 3,784 | 4,324 | 26.7 | 8.2 |
| 7 DD | Area 4 | 3,715 | 4,906 | 28.8 | 2.7 |
| 9 DD | Area 4 | 674 | 2,730 | 15.5 | 2.0 |
| UT. FRAC. | Area 1 | 331 | 798 | 3.2 | 1.1 |
| PENEX | Area 1 | 4,375 | 1,260 | 22.6 | 0.9 |
| 2 PLAT/2 HYDROBON | Area 2 | 3,198 | 905 | 17.8 | 1.5 |
| 3 PLAT / 3 HYDROBON | Area 4 | 4,600 | 1,998 | 26.5 | 2.0 |
| 4 PLAT / 4 HYDROBON | Area 4 | 4,660 | 1,998 | 27.8 | 2.0 |
| LSG | Area 4 | 6,125 | - | 23.6 | - |
| 2 SULFOLANE | Area 3 | 9,115 | 2,046 | 35.6 | - |
| DISULFIDE | Area 4 | - | 345 | 0.3 | 2.6 |
| NAP FRAC. | Area 2 | 1,204 | 414 | 5.8 | 1.5 |
| DEISO-HEXANIZER | Area 3 | 858 | 40 | 3.6 | 0.5 |
| AMINE (3,4,5 & T-931) | Area 1 / Area 3 | 1,358 | 3,827 | 7.6 | 24.5 |
| MEROX | Area 3 / FCC Complex | 2,385 | 248 | 6.6 | 0.2 |
| 1&2 GRU/H2 CON | Area 2 / Area 3 | 1,134 | 3,231 | 17.8 | 3.2 |
| 1&2 LPG TREATER | Area 3 | - | 1,194 | 2.0 | 0.3 |
| 3 LPG FRAC | Area 3 | - | 970 | 2.0 | 1.6 |
| FCC & GASCON | FCC Complex | 12,191 | 8,867 | 61.8 | 7.3 |
| DIMERSOL | FCC Complex | 5,810 | 145 | 20.2 | 2.6 |
| 6 AMINE & SHU | FCC Complex | - | 2,823 | - | 10.4 |
| ALKY & ACID PLANT | FCC Complex | 9,108 | 1,717 | 33.4 | 40.6 |
| LIGHT ENDS TREAT | FCC Complex | 2,938 | - | 15.5 | - |
| MTBE | FCC Complex | 3,842 | - | 12.2 | - |
| TAME | FCC Complex | 4,019 | - | 15.3 | - |
| SELECTIVE HYDRO | FCC Complex | 3,907 | - | 13.8 | - |
| 1 BEAVON / 1&2 SRU | West Sulfur Complex | 599 | - | 3.0 | - |
| 2 BEAVON / 3&4 SRU | East Sulfur Complex | 447 | - | 2.9 | - |
| SRU | East & West Sulfur Complex | - | 1,796 | - | 43.4 |
| 3 SWS | East Sulfur Complex | - | 799 | - | 9.6 |
| 4 SWS | East Sulfur Complex | - | 796 | - | 9.1 |
| 5 SWS | East Sulfur Complex | - | 1,271 | - | 17.9 |
| 6 SWS | 6 SWS | 217 | 1,271 | 1.1 | 17.9 |
| DELAYED COKER | Coker Complex | 14,987 | 8,211 | 66.8 | 0.8 |
| Utilities (Powerhouse and Boilers) | Utility II & III | 1,891 | 1,337 | 17 | - |
| EAST FUEL GAS SYSTEM | - | 943 | 5,590 | 19.3 | - |
| WEST FUEL GAS SYSTEM | - | 939 | 5,590 | 19.1 | - |
| TERMINAL (OFFSITES/RUNDOWNS/XFERS) | Terminal | 40,420 | 30,328 | 241 | - |
| **TOTAL SITEWIDE** | | **181,708** | **150,812** | **1,096** | **276** |

**Limetree Bay Terminals and Refining**
**B-16 Fugitives Annual Potential to Emit**

__Description__: fugitive emissions are quantified by the number, type of component and service (gas/vapor, light liquid, heavy liquid). The EPA "Protocol for Equipment Leak Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18), establish specific emission factors based on these variables and for different industrial activities. The TCEQ guidance also provides control efficiencies credits that can be applied to account for the reduction of emissions with the implementation of different LDAR programs. The TCEQ emission factors for refineries (Table II)are used for the emission calculations for all component types except for components in MDEA amine, ammopure and ammonia service, for which the TCEQ SOCMI Average emission factors (Table I) are used. The TCEQ emission factors are identical to the 1995 EPA published emission factors. The emission estimates are based on the assumption that all piping components have the potential to emit at all times (8,760 hr/yr). Limetree LDAR program has a leak definition for refinery pumps of 2,000 ppm VOC and for refinery valves of 500 ppm VOC per Consent Decree ¶109. All equipment is monitored quaterly. This meets the requirements of the 28VHP LDAR program as established in the TCEQ guidance (Table III). Therefore, for monitored components, emissions calculations include a reduction credit based on the TCEQ proposed monitoring control efficiency for the 28 VHP LDAR Program (Table V). Equipment marked with "ɫ" indicate that though it was previously not monitored it is required under current regulation to be monitored, and therefore, for PTE calculations it is capturedas monitored equipment.

**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| 2 CDU | Area 1 | Valves | Gas/Vapor | 276 | - | 0.059 | 97% | 2.1 |
| | | | Light Liquid | 950 | - | 0.024 | 97% | 3.0 |
| | | | Heavy Liquid | - | 516 | 0.0005 | 0% | 1.2 |
| | | | LL (SOCMI) | - | 5 | 0.0089 | 97% | 0.2 |
| | | Connectors | Gas/Vapor | 8 | - | 0.00055 | 30% | 0.01 |
| | | | Light Liquid | 1,595 | 1,566 | 0.00055 | 30% | 6.5 |
| | | | Heavy Liquid | - | 1,550 | 0.00055 | 30% | 3.7 |
| | | | LL (SOCMI) | - | 15 | 0.0005 | 30% | 0.03 |
| | | Pressure Relief Valves | Gas/Vapor | 33 | - | 0.35 | 97% | 1.5 |
| | | Pressure Relief Valves ɫ | Gas/Vapor | - | 10 | 0.35 | 97% | 0.4 |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | 9 | - | 0.251 | 85% | 1.5 |
| | | | Heavy Liquid | - | 10 | 0.046 | 0% | 2.1 |
| | | | LL (SOCMI) | - | 1 | 0.0439 | 85% | 0.2 |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | 1 | 0.0038 | 0% | 0.02 |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | 3 | 0.033 | 0% | 0.5 |
| 3 CDU / 1 VAC | Area 1 | Valves | Gas/Vapor | 437 | - | 0.059 | 97% | 3.4 |
| | | | Light Liquid | 614 | - | 0.024 | 97% | 1.9 |
| | | | Heavy Liquid | - | 597 | 0.0005 | 0% | 1.3 |
| | | | LL (SOCMI) | - | 97 | 0.0089 | 1.0 | 3.8 |
| | | Connectors | Gas/Vapor | 213 | 21 | 0.00055 | 30% | 0.41 |
| | | | Light Liquid | 1,113 | 1,566 | 0.00055 | 30% | 5.6 |
| | | | Heavy Liquid | - | 1,793 | 0.00055 | 30% | 4.3 |
| | | | LL (SOCMI) | - | 291 | 0.0005 | 30% | 0.64 |
| | | Pressure Relief Valves | Gas/Vapor | 16 | - | 0.35 | 97% | 0.7 |
| | | Pressure Relief Valves ɫ | Gas/Vapor | - | 7 | 0.35 | 97% | 0.3 |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | 6 | - | 0.251 | 85% | 1.0 |
| | | | Heavy Liquid | - | 14 | 0.046 | 0% | 2.7 |
| | | | LL (SOCMI) | - | 1 | 0.0439 | 85% | 0.2 |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | 1 | 0.0038 | 0% | 0.02 |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | 4 | 0.033 | 0% | 0.6 |

**Limetree Bay Terminals and Refining**
**B-16 Fugitives Annual Potential to Emit**

**Description**: fugitive emissions are quantified by the number, type of component and service (gas/vapor, light liquid, heavy liquid). The EPA "Protocol for Equipment Leak Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18), establish specific emission factors based on these variables and for different industrial activities. The TCEQ guidance also provides control efficiencies credits that can be applied to account for the reduction of emissions with the implementation of different LDAR programs. The TCEQ emission factors for refineries (Table II)are used for the emission calculations for all component types except for components in MDEA amine, ammopure and ammonia service, for which the TCEQ SOCMI Average emission factors (Table I) are used. The TCEQ emission factors are identical to the 1995 EPA published emission factors. The emission estimates are based on the assumption that all piping components have the potential to emit at all times (8,760 hr/yr). Limetree LDAR program has a leak definition for refinery pumps of 2,000 ppm VOC and for refinery valves of 500 ppm VOC per Consent Decree ¶109. All equipment is monitored quaterly. This meets the requirements of the 28VHP LDAR program as established in the TCEQ guidance (Table III). Therefore, for monitored components, emissions calculations include a reduction credit based on the TCEQ proposed monitoring control efficiency for the 28 VHP LDAR Program (Table V). Equipment marked with "ŧ" indicate that though it was previously not monitored it is required under current regulation to be monitored, and therefore, for PTE calculations it is capturedas monitored equipment.

**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| 5 CDU | Area 3 | Valves | Gas/Vapor | 514 | - | 0.059 | 97% | 4.0 |
| | | | Light Liquid | 1,695 | - | 0.024 | 97% | 5.3 |
| | | | Heavy Liquid | - | 1,221 | 0.0005 | 0% | 2.7 |
| | | | LL (SOCMI) | - | 285 | 0.0089 | 1.0 | 11.1 |
| | | Connectors | Gas/Vapor | 320 | - | 0.00055 | 30% | 0.54 |
| | | | Light Liquid | 2,962 | 1,507 | 0.00055 | 30% | 8.6 |
| | | | Heavy Liquid | - | 3,635 | 0.00055 | 30% | 8.8 |
| | | | LL (SOCMI) | - | 855 | 0.0005 | 30% | 1.87 |
| | | Pressure Relief Valves | Gas/Vapor | 39 | - | 0.35 | 97% | 1.8 |
| | | Pressure Relief Valves ŧ | Gas/Vapor | - | 10 | 0.35 | 97% | 0.4 |
| | | Compressor seals | Gas/Vapor | 1 | - | 1.399 | 85% | 0.9 |
| | | Pump seals | Light Liquid | 21 | - | 0.251 | 85% | 3.5 |
| | | | Heavy Liquid | - | 14 | 0.046 | 0% | 2.8 |
| | | | LL (SOCMI) | - | 1 | 0.0439 | 85% | 0.2 |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | 1 | 0.0038 | 0% | 0.02 |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | 5 | 0.033 | 0% | 0.7 |
| 6 CDU | Area 3 | Valves | Gas/Vapor | 403 | - | 0.059 | 97% | 3.1 |
| | | | Light Liquid | 1,877 | - | 0.024 | 97% | 5.9 |
| | | | Heavy Liquid | - | 1,307 | 0.0005 | 0% | 2.9 |
| | | | LL (SOCMI) | - | 285 | 0.0089 | 1.0 | 11.1 |
| | | Connectors | Gas/Vapor | 65 | - | 0.00055 | 30% | 0.11 |
| | | | Light Liquid | 3,510 | 1,507 | 0.00055 | 30% | 9.5 |
| | | | Heavy Liquid | - | 3,953 | 0.00055 | 30% | 9.5 |
| | | | LL (SOCMI) | - | 855 | 0.0005 | 30% | 1.87 |
| | | Pressure Relief Valves | Gas/Vapor | 40 | - | 0.35 | 97% | 1.8 |
| | | Pressure Relief Valves ŧ | Gas/Vapor | - | 10 | 0.35 | 97% | 0.4 |
| | | Compressor seals | Gas/Vapor | 4 | - | 1.399 | 85% | 3.7 |
| | | Pump seals | Light Liquid | 25 | - | 0.251 | 85% | 4.1 |
| | | | Heavy Liquid | - | 14 | 0.046 | 0% | 2.8 |
| | | | LL (SOCMI) | - | 1 | 0.0439 | 85% | 0.2 |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | 1 | 0.0038 | 0% | 0.02 |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | 5 | 0.033 | 0% | 0.7 |

**Limetree Bay Terminals and Refining**
**B-16 Fugitives Annual Potential to Emit**

**Description**: fugitive emissions are quantified by the number, type of component and service (gas/vapor, light liquid, heavy liquid). The EPA "Protocol for Equipment Leak Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18), establish specific emission factors based on these variables and for different industrial activities. The TCEQ guidance also provides control efficiencies credits that can be applied to account for the reduction of emissions with the implementation of different LDAR programs. The TCEQ emission factors for refineries (Table II)are used for the emission calculations for all component types except for components in MDEA amine, ammopure and ammonia service, for which the TCEQ SOCMI Average emission factors (Table I) are used. The TCEQ emission factors are identical to the 1995 EPA published emission factors. The emission estimates are based on the assumption that all piping components have the potential to emit at all times (8,760 hr/yr). Limetree LDAR program has a leak definition for refinery pumps of 2,000 ppm VOC and for refinery valves of 500 ppm VOC per Consent Decree ¶109. All equipment is monitored quaterly. This meets the requirements of the 28VHP LDAR program as established in the TCEQ guidance (Table III). Therefore, for monitored components, emissions calculations include a reduction credit based on the TCEQ proposed monitoring control efficiency for the 28 VHP LDAR Program (Table V). Equipment marked with "ł" indicate that though it was previously not monitored it is required under current regulation to be monitored, and therefore, for PTE calculations it is capturedas monitored equipment.

**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| 2 VAC | Area 2 | Valves | Gas/Vapor | 341 | - | 0.059 | 97% | 2.6 |
| | | | Light Liquid | - | - | 0.024 | 97% | - |
| | | | Heavy Liquid | - | 820 | 0.0005 | 0% | 1.8 |
| | | | LL (SOCMI) | - | 101 | 0.0089 | 1.0 | 3.9 |
| | | Connectors | Gas/Vapor | - | 21 | 0.00055 | 30% | 0.05 |
| | | | Light Liquid | - | - | 0.00055 | 30% | - |
| | | | Heavy Liquid | - | 2,460 | 0.00055 | 30% | 5.9 |
| | | | LL (SOCMI) | - | 303 | 0.0005 | 30% | 0.66 |
| | | Pressure Relief Valves | Gas/Vapor | 4 | - | 0.35 | 97% | 0.2 |
| | | Pressure Relief Valves ł | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | - | - | 0.251 | 85% | - |
| | | | Heavy Liquid | - | 11 | 0.046 | 0% | 2.1 |
| | | | LL (SOCMI) | - | 1 | 0.0439 | 85% | 0.2 |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | 1 | 0.0038 | 0% | 0.02 |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | 5 | 0.033 | 0% | 0.7 |
| 3 VAC | Area 4 | Valves | Gas/Vapor | 643 | - | 0.059 | 97% | 5.0 |
| | | | Light Liquid | 89 | - | 0.024 | 97% | 0.3 |
| | | | Heavy Liquid | - | 1,282 | 0.0005 | 0% | 2.9 |
| | | | LL (SOCMI) | - | 87 | 0.0089 | 1.0 | 3.4 |
| | | Connectors | Gas/Vapor | 246 | 21 | 0.00055 | 30% | 0.47 |
| | | | Light Liquid | 177 | - | 0.00055 | 30% | 0.3 |
| | | | Heavy Liquid | - | 3,846 | 0.00055 | 30% | 9.3 |
| | | | LL (SOCMI) | - | 261 | 0.0005 | 30% | 0.57 |
| | | Pressure Relief Valves | Gas/Vapor | 9 | - | 0.35 | 97% | 0.4 |
| | | Pressure Relief Valves ł | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | 2 | - | 1.399 | 85% | 1.8 |
| | | Pump seals | Light Liquid | 2 | - | 0.251 | 85% | 0.3 |
| | | | Heavy Liquid | - | 10 | 0.046 | 0% | 1.9 |
| | | | LL (SOCMI) | - | 1 | 0.0439 | 85% | 0.2 |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | 1 | 0.0038 | 0% | 0.02 |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | 4 | 0.033 | 0% | 0.6 |

**Limetree Bay Terminals and Refining**
**B-16 Fugitives Annual Potential to Emit**

**Description**: fugitive emissions are quantified by the number, type of component and service (gas/vapor, light liquid, heavy liquid). The EPA "Protocol for Equipment Leak Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18), establish specific emission factors based on these variables and for different industrial activities. The TCEQ guidance also provides control efficiencies credits that can be applied to account for the reduction of emissions with the implementation of different LDAR programs. The TCEQ emission factors for refineries (Table II)are used for the emission calculations for all component types except for components in MDEA amine, ammopure and ammonia service, for which the TCEQ SOCMI Average emission factors (Table I) are used. The TCEQ emission factors are identical to the 1995 EPA published emission factors. The emission estimates are based on the assumption that all piping components have the potential to emit at all times (8,760 hr/yr). Limetree LDAR program has a leak definition for refinery pumps of 2,000 ppm VOC and for refinery valves of 500 ppm VOC per Consent Decree ¶109. All equipment is monitored quaterly. This meets the requirements of the 28VHP LDAR program as established in the TCEQ guidance (Table III). Therefore, for monitored components, emissions calculations include a reduction credit based on the TCEQ proposed monitoring control efficiency for the 28 VHP LDAR Program (Table V). Equipment marked with "ƚ" indicate that though it was previously not monitored it is required under current regulation to be monitored, and therefore, for PTE calculations it is capturedas monitored equipment.

**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| 1 VIS (2 DU FRAC) | Area 1 | Valves | Gas/Vapor | 394 | - | 0.059 | 97% | 3.1 |
| | | | Light Liquid | 255 | - | 0.024 | 97% | 0.8 |
| | | | Heavy Liquid | - | 806 | 0.0005 | 0% | 1.8 |
| | | | LL (SOCMI) | - | 47 | 0.0089 | 1.0 | 1.8 |
| | | Connectors | Gas/Vapor | 334 | - | 0.00055 | 30% | 0.56 |
| | | | Light Liquid | 510 | - | 0.00055 | 30% | 0.9 |
| | | | Heavy Liquid | - | 2,418 | 0.00055 | 30% | 5.8 |
| | | | LL (SOCMI) | - | 141 | 0.0005 | 30% | 0.31 |
| | | Pressure Relief Valves | Gas/Vapor | 9 | - | 0.35 | 97% | 0.4 |
| | | Pressure Relief Valves ƚ | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | 11 | - | 0.251 | 85% | 1.8 |
| | | | Heavy Liquid | - | 14 | 0.046 | 0% | 2.9 |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | 7 | 0.033 | 0% | 1.0 |
| 2 VIS | Area 2 | Valves | Gas/Vapor | 415 | - | 0.059 | 97% | 3.2 |
| | | | Light Liquid | 302 | - | 0.024 | 97% | 1.0 |
| | | | Heavy Liquid | - | 334 | 0.0005 | 0% | 0.7 |
| | | | LL (SOCMI) | - | 49 | 0.0089 | 1.0 | 1.9 |
| | | Connectors | Gas/Vapor | 26 | 34 | 0.00055 | 30% | 0.13 |
| | | | Light Liquid | 596 | - | 0.00055 | 30% | 1.0 |
| | | | Heavy Liquid | - | 1,002 | 0.00055 | 30% | 2.4 |
| | | | LL (SOCMI) | - | 147 | 0.0005 | 30% | 0.32 |
| | | Pressure Relief Valves | Gas/Vapor | 10 | - | 0.35 | 97% | 0.5 |
| | | Pressure Relief Valves ƚ | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | 7 | - | 0.251 | 85% | 1.2 |
| | | | Heavy Liquid | - | 5 | 0.046 | 0% | 1.0 |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | 2 | 0.033 | 0% | 0.3 |

**Limetree Bay Terminals and Refining**
**B-16 Fugitives Annual Potential to Emit**

**Description**: fugitive emissions are quantified by the number, type of component and service (gas/vapor, light liquid, heavy liquid). The EPA "Protocol for Equipment Leak Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18), establish specific emission factors based on these variables and for different industrial activities. The TCEQ guidance also provides control efficiencies credits that can be applied to account for the reduction of emissions with the implementation of different LDAR programs. The TCEQ emission factors for refineries (Table II)are used for the emission calculations for all component types except for components in MDEA amine, ammopure and ammonia service, for which the TCEQ SOCMI Average emission factors (Table I) are used. The TCEQ emission factors are identical to the 1995 EPA published emission factors. The emission estimates are based on the assumption that all piping components have the potential to emit at all times (8,760 hr/yr). Limetree LDAR program has a leak definition for refinery pumps of 2,000 ppm VOC and for refinery valves of 500 ppm VOC per Consent Decree ¶109. All equipment is monitored quaterly. This meets the requirements of the 28VHP LDAR program as established in the TCEQ guidance (Table III). Therefore, for monitored components, emissions calculations include a reduction credit based on the TCEQ proposed monitoring control efficiency for the 28 VHP LDAR Program (Table V). Equipment marked with "ǂ" indicate that though it was previously not monitored it is required under current regulation to be monitored, and therefore, for PTE calculations it is capturedas monitored equipment.

**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| 2 DD | Area 2 | Valves | Gas/Vapor | 1,082 | - | 0.059 | 97% | 8.4 |
| | | | Light Liquid | 814 | - | 0.024 | 97% | 2.6 |
| | | | Heavy Liquid | - | 676 | 0.0005 | 0% | 1.5 |
| | | | LL (SOCMI) | - | 106 | 0.0089 | 97% | 4.1 |
| | | Connectors | Gas/Vapor | 1,284 | - | 0.00055 | 30% | 2.17 |
| | | | Light Liquid | 1,276 | - | 0.00055 | 30% | 2.2 |
| | | | Heavy Liquid | - | 2,028 | 0.00055 | 30% | 4.9 |
| | | | LL (SOCMI) | - | 318 | 0.0005 | 30% | 0.7 |
| | | Pressure Relief Valves | Gas/Vapor | 33 | - | 0.35 | 97% | 1.5 |
| | | Pressure Relief Valves ǂ | Gas/Vapor | - | 3 | 0.35 | 97% | 0.1 |
| | | Compressor seals | Gas/Vapor | 6 | - | 1.399 | 85% | 5.5 |
| | | Pump seals | Light Liquid | 6 | - | 0.251 | 85% | 1.0 |
| | | | Heavy Liquid | - | 9 | 0.046 | 0% | 1.8 |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | 5 | 0.033 | 0% | 0.7 |
| 3 DD | Area 1 | Valves | Gas/Vapor | 334 | - | 0.059 | 97% | 2.6 |
| | | | Light Liquid | 588 | - | 0.024 | 97% | 1.9 |
| | | | Heavy Liquid | - | 378 | 0.0005 | 0% | 0.8 |
| | | | LL (SOCMI) | - | 41 | 0.0089 | 97% | 1.6 |
| | | Connectors | Gas/Vapor | 55 | - | 0.00055 | 30% | 0.09 |
| | | | Light Liquid | 977 | - | 0.00055 | 30% | 1.6 |
| | | | Heavy Liquid | - | 1,134 | 0.00055 | 30% | 2.7 |
| | | | LL (SOCMI) | - | 123 | 0.0005 | 30% | 0.3 |
| | | Pressure Relief Valves | Gas/Vapor | 11 | - | 0.35 | 97% | 0.5 |
| | | Pressure Relief Valves ǂ | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | 3 | - | 1.399 | 85% | 2.8 |
| | | Pump seals | Light Liquid | 7 | - | 0.251 | 85% | 1.2 |
| | | | Heavy Liquid | - | 1 | 0.046 | 0% | 0.2 |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | 1 | 0.033 | 0% | 0.1 |

**Limetree Bay Terminals and Refining**
**B-16 Fugitives Annual Potential to Emit**

**Description**: fugitive emissions are quantified by the number, type of component and service (gas/vapor, light liquid, heavy liquid). The EPA "Protocol for Equipment Leak Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18), establish specific emission factors based on these variables and for different industrial activities. The TCEQ guidance also provides control efficiencies credits that can be applied to account for the reduction of emissions with the implementation of different LDAR programs. The TCEQ emission factors for refineries (Table II)are used for the emission calculations for all component types except for components in MDEA amine, ammopure and ammonia service, for which the TCEQ SOCMI Average emission factors (Table I) are used. The TCEQ emission factors are identical to the 1995 EPA published emission factors. The emission estimates are based on the assumption that all piping components have the potential to emit at all times (8,760 hr/yr). Limetree LDAR program has a leak definition for refinery pumps of 2,000 ppm VOC and for refinery valves of 500 ppm VOC per Consent Decree ¶109. All equipment is monitored quaterly. This meets the requirements of the 28VHP LDAR program as established in the TCEQ guidance (Table III). Therefore, for monitored components, emissions calculations include a reduction credit based on the TCEQ proposed monitoring control efficiency for the 28 VHP LDAR Program (Table V). Equipment marked with "ǂ" indicate that though it was previously not monitored it is required under current regulation to be monitored, and therefore, for PTE calculations it is capturedas monitored equipment.

**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| 4 DD | Area 2 | Valves | Gas/Vapor | 1,177 | - | 0.059 | 97% | 9.1 |
| | | | Light Liquid | 279 | - | 0.024 | 97% | 0.9 |
| | | | Heavy Liquid | - | 791 | 0.0005 | 0% | 1.8 |
| | | | LL (SOCMI) | - | 173 | 0.0089 | 97% | 6.7 |
| | | | HL (SOCMI) | - | 162 | 0.0005 | 0% | 0.4 |
| | | Connectors | Gas/Vapor | 1,651 | - | 0.00055 | 30% | 2.78 |
| | | | Light Liquid | 510 | - | 0.00055 | 30% | 0.9 |
| | | | Heavy Liquid | - | 2,373 | 0.00055 | 30% | 5.7 |
| | | | LL (SOCMI) | - | 519 | 0.0005 | 30% | 1.1 |
| | | | HL (SOCMI) | - | 486 | 0.00007 | 30% | 0.1 |
| | | Pressure Relief Valves | Gas/Vapor | 30 | - | 0.35 | 97% | 1.4 |
| | | Pressure Relief Valves ǂ | Gas/Vapor | - | 2 | 0.35 | 97% | 0.1 |
| | | Compressor seals | Gas/Vapor | 3 | - | 1.399 | 85% | 2.8 |
| | | Pump seals | Light Liquid | 2 | - | 0.251 | 85% | 0.3 |
| | | | Heavy Liquid | - | 1 | 0.046 | 0% | 0.3 |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | 1 | 0.033 | 0% | 0.1 |
| 5 DD | Area 2 | Valves | Gas/Vapor | 255 | - | 0.059 | 97% | 2.0 |
| | | | Light Liquid | 149 | - | 0.024 | 97% | 0.5 |
| | | | Heavy Liquid | - | 436 | 0.0005 | 0% | 1.0 |
| | | | LL (SOCMI) | - | 46 | 0.0089 | 97% | 1.8 |
| | | Connectors | Gas/Vapor | - | - | 0.00055 | 30% | - |
| | | | Light Liquid | 261 | - | 0.00055 | 30% | 0.4 |
| | | | Heavy Liquid | - | 1,308 | 0.00055 | 30% | 3.2 |
| | | | LL (SOCMI) | - | 138 | 0.0005 | 30% | 0.3 |
| | | Pressure Relief Valves | Gas/Vapor | 9 | - | 0.35 | 97% | 0.4 |
| | | Pressure Relief Valves ǂ | Gas/Vapor | - | 2 | 0.35 | 97% | 0.1 |
| | | Compressor seals | Gas/Vapor | 2 | - | 1.399 | 85% | 1.8 |
| | | Pump seals | Light Liquid | 2 | - | 0.251 | 85% | 0.3 |
| | | | Heavy Liquid | - | 1 | 0.046 | 0% | 0.3 |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | 1 | 0.033 | 0% | 0.2 |

## Limetree Bay Terminals and Refining
## B-16 Fugitives Annual Potential to Emit

**Description**: fugitive emissions are quantified by the number, type of component and service (gas/vapor, light liquid, heavy liquid). The EPA "Protocol for Equipment Leak Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18), establish specific emission factors based on these variables and for different industrial activities. The TCEQ guidance also provides control efficiencies credits that can be applied to account for the reduction of emissions with the implementation of different LDAR programs. The TCEQ emission factors for refineries (Table II)are used for the emission calculations for all component types except for components in MDEA amine, ammopure and ammonia service, for which the TCEQ SOCMI Average emission factors (Table I) are used. The TCEQ emission factors are identical to the 1995 EPA published emission factors. The emission estimates are based on the assumption that all piping components have the potential to emit at all times (8,760 hr/yr). Limetree LDAR program has a leak definition for refinery pumps of 2,000 ppm VOC and for refinery valves of 500 ppm VOC per Consent Decree ¶109. All equipment is monitored quaterly. This meets the requirements of the 28VHP LDAR program as established in the TCEQ guidance (Table III). Therefore, for monitored components, emissions calculations include a reduction credit based on the TCEQ proposed monitoring control efficiency for the 28 VHP LDAR Program (Table V). Equipment marked with "ƚ" indicate that though it was previously not monitored it is required under current regulation to be monitored, and therefore, for PTE calculations it is capturedas monitored equipment.

**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| 6 DD | Area 4 | Valves | Gas/Vapor | 1,264 | - | 0.059 | 97% | 9.8 |
| | | | Light Liquid | 319 | - | 0.024 | 97% | 1.0 |
| | | | Heavy Liquid | - | 781 | 0.0005 | 0% | 1.7 |
| | | | LL (SOCMI) | - | 171 | 0.0089 | 97% | 6.7 |
| | | | HL (SOCMI) | - | 128 | 0.0005 | 0% | 0.3 |
| | | Connectors | Gas/Vapor | 1,545 | - | 0.00055 | 30% | 2.61 |
| | | | Light Liquid | 623 | - | 0.00055 | 30% | 1.1 |
| | | | Heavy Liquid | - | 2,343 | 0.00055 | 30% | 5.6 |
| | | | LL (SOCMI) | - | 513 | 0.0005 | 30% | 1.1 |
| | | | HL (SOCMI) | - | 384 | 0.00007 | 30% | 0.1 |
| | | Pressure Relief Valves | Gas/Vapor | 28 | - | 0.35 | 97% | 1.3 |
| | | Pressure Relief Valves ƚ | Gas/Vapor | - | 2 | 0.35 | 97% | 0.1 |
| | | Compressor seals | Gas/Vapor | 3 | - | 1.399 | 85% | 2.8 |
| | | Pump seals | Light Liquid | 2 | - | 0.251 | 85% | 0.3 |
| | | | Heavy Liquid | - | 1 | 0.046 | 0% | 0.3 |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | 1 | 0.033 | 0% | 0.1 |
| 7 DD | Area 4 | Valves | Gas/Vapor | 1,191 | - | 0.059 | 97% | 9.2 |
| | | | Light Liquid | 277 | - | 0.024 | 97% | 0.9 |
| | | | Heavy Liquid | - | 946 | 0.0005 | 0% | 2.1 |
| | | | LL (SOCMI) | - | 43 | 0.0089 | 97% | 1.7 |
| | | | HL (SOCMI) | - | 235 | 0.0005 | 0% | 0.5 |
| | | Connectors | Gas/Vapor | 1,676 | - | 0.00055 | 30% | 2.83 |
| | | | Light Liquid | 540 | - | 0.00055 | 30% | 0.9 |
| | | | Heavy Liquid | - | 2,838 | 0.00055 | 30% | 6.8 |
| | | | LL (SOCMI) | - | 129 | 0.0005 | 30% | 0.3 |
| | | | HL (SOCMI) | - | 705 | 0.00007 | 30% | 0.2 |
| | | Pressure Relief Valves | Gas/Vapor | 25 | - | 0.35 | 97% | 1.1 |
| | | Pressure Relief Valves ƚ | Gas/Vapor | - | 2 | 0.35 | 97% | 0.1 |
| | | Compressor seals | Gas/Vapor | 3 | - | 1.399 | 85% | 2.8 |
| | | Pump seals | Light Liquid | 3 | - | 0.251 | 85% | 0.5 |
| | | | Heavy Liquid | - | 6 | 0.046 | 0% | 1.2 |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | 2 | 0.033 | 0% | 0.3 |

**Limetree Bay Terminals and Refining**
**B-16 Fugitives Annual Potential to Emit**

**Description**: fugitive emissions are quantified by the number, type of component and service (gas/vapor, light liquid, heavy liquid). The EPA "Protocol for Equipment Leak Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18), establish specific emission factors based on these variables and for different industrial activities. The TCEQ guidance also provides control efficiencies credits that can be applied to account for the reduction of emissions with the implementation of different LDAR programs. The TCEQ emission factors for refineries (Table II)are used for the emission calculations for all component types except for components in MDEA amine, ammopure and ammonia service, for which the TCEQ SOCMI Average emission factors (Table I) are used. The TCEQ emission factors are identical to the 1995 EPA published emission factors. The emission estimates are based on the assumption that all piping components have the potential to emit at all times (8,760 hr/yr). Limetree LDAR program has a leak definition for refinery pumps of 2,000 ppm VOC and for refinery valves of 500 ppm VOC per Consent Decree ¶109. All equipment is monitored quaterly. This meets the requirements of the 28VHP LDAR program as established in the TCEQ guidance (Table III). Therefore, for monitored components, emissions calculations include a reduction credit based on the TCEQ proposed monitoring control efficiency for the 28 VHP LDAR Program (Table V). Equipment marked with "ɫ" indicate that though it was previously not monitored it is required under current regulation to be monitored, and therefore, for PTE calculations it is capturedas monitored equipment.

**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| 9 DD | Area 4 | Valves | Gas/Vapor | 295 | - | 0.059 | 97% | 2.3 |
| | | | Light Liquid | 125 | - | 0.024 | 97% | 0.4 |
| | | | Heavy Liquid | - | 635 | 0.0005 | 0% | 1.4 |
| | | | LL (SOCMI) | - | 43 | 0.0089 | 97% | 1.7 |
| | | Connectors | Gas/Vapor | 8 | - | 0.00055 | 30% | 0.01 |
| | | | Light Liquid | 236 | - | 0.00055 | 30% | 0.4 |
| | | | Heavy Liquid | - | 1,905 | 0.00055 | 30% | 4.6 |
| | | | LL (SOCMI) | - | 129 | 0.0005 | 30% | 0.3 |
| | | Pressure Relief Valves | Gas/Vapor | 5 | - | 0.35 | 97% | 0.2 |
| | | Pressure Relief Valves ɫ | Gas/Vapor | - | 2 | 0.35 | 97% | 0.1 |
| | | Compressor seals | Gas/Vapor | 3 | - | 1.399 | 85% | 2.8 |
| | | Pump seals | Light Liquid | 2 | - | 0.251 | 85% | 0.3 |
| | | | Heavy Liquid | - | 12 | 0.046 | 0% | 2.4 |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | 5 | 0.033 | 0% | 0.7 |
| UT. FRAC. | Area 1 | Valves | Gas/Vapor | - | - | 0.059 | 97% | - |
| | | | Light Liquid | 113 | - | 0.024 | 97% | 0.4 |
| | | | Heavy Liquid | - | 175 | 0.0005 | 0% | 0.4 |
| | | | LL (SOCMI) | - | 24 | 0.0089 | 97% | 0.9 |
| | | Connectors | Gas/Vapor | - | - | 0.00055 | 30% | - |
| | | | Light Liquid | 213 | - | 0.00055 | 30% | 0.4 |
| | | | Heavy Liquid | - | 525 | 0.00055 | 30% | 1.3 |
| | | | LL (SOCMI) | - | 72 | 0.0005 | 30% | 0.2 |
| | | Pressure Relief Valves | Gas/Vapor | 3 | - | 0.35 | 97% | 0.1 |
| | | Pressure Relief Valves ɫ | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | 2 | - | 0.251 | 85% | 0.3 |
| | | | Heavy Liquid | - | 1 | 0.046 | 0% | 0.3 |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | 0.5 | 0.033 | 0% | 0.1 |

## Limetree Bay Terminals and Refining
## B-16 Fugitives Annual Potential to Emit

**Description**: fugitive emissions are quantified by the number, type of component and service (gas/vapor, light liquid, heavy liquid). The EPA "Protocol for Equipment Leak Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18), establish specific emission factors based on these variables and for different industrial activities. The TCEQ guidance also provides control efficiencies credits that can be applied to account for the reduction of emissions with the implementation of different LDAR programs. The TCEQ emission factors for refineries (Table II)are used for the emission calculations for all component types except for components in MDEA amine, ammopure and ammonia service, for which the TCEQ SOCMI Average emission factors (Table I) are used. The TCEQ emission factors are identical to the 1995 EPA published emission factors. The emission estimates are based on the assumption that all piping components have the potential to emit at all times (8,760 hr/yr). Limetree LDAR program has a leak definition for refinery pumps of 2,000 ppm VOC and for refinery valves of 500 ppm VOC per Consent Decree ¶109. All equipment is monitored quaterly. This meets the requirements of the 28VHP LDAR program as established in the TCEQ guidance (Table III). Therefore, for monitored components, emissions calculations include a reduction credit based on the TCEQ proposed monitoring control efficiency for the 28 VHP LDAR Program (Table V). Equipment marked with "ɫ" indicate that though it was previously not monitored it is required under current regulation to be monitored, and therefore, for PTE calculations it is capturedas monitored equipment.

**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| PENEX | Area 1 | Valves | Gas/Vapor | 612 | - | 0.059 | 97% | 4.7 |
| | | | Light Liquid | 1,330 | - | 0.024 | 97% | 4.2 |
| | | | Heavy Liquid | - | 108 | 0.0005 | 0% | 0.2 |
| | | | LL (SOCMI) | - | 20 | 0.0089 | 97% | 0.8 |
| | | Connectors | Gas/Vapor | 52 | - | 0.00055 | 30% | 0.09 |
| | | | Light Liquid | 2,331 | 745 | 0.00055 | 30% | 5.7 |
| | | | Heavy Liquid | - | 324 | 0.00055 | 30% | 0.8 |
| | | | LL (SOCMI) | - | 60 | 0.0005 | 30% | 0.1 |
| | | Pressure Relief Valves | Gas/Vapor | 36 | - | 0.35 | 97% | 1.7 |
| | | Pressure Relief Valves ɫ | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | 3 | - | 1.399 | 85% | 2.8 |
| | | Pump seals | Light Liquid | 11 | - | 0.251 | 85% | 1.8 |
| | | | Heavy Liquid | - | 2 | 0.046 | 0% | 0.4 |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | 1 | 0.033 | 0% | 0.1 |
| 2 PLAT/2 HYDROBON | Area 2 | Valves | Gas/Vapor | 474 | - | 0.059 | 97% | 3.7 |
| | | | Light Liquid | 793 | - | 0.024 | 97% | 2.5 |
| | | | Heavy Liquid | - | 14 | 0.0005 | 0% | 0.0 |
| | | | LL (SOCMI) | - | 32 | 0.0089 | 97% | 1.2 |
| | | Connectors | Gas/Vapor | 4 | - | 0.00055 | 30% | 0.01 |
| | | | Light Liquid | 984 | 720 | 0.00055 | 30% | 3.4 |
| | | | Heavy Liquid | - | 42 | 0.00055 | 30% | 0.1 |
| | | | LL (SOCMI) | - | 96 | 0.0005 | 30% | 0.2 |
| | | Pressure Relief Valves | Gas/Vapor | 13 | - | 0.35 | 97% | 0.6 |
| | | Pressure Relief Valves ɫ | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | 2 | - | 1.399 | 85% | 1.8 |
| | | Pump seals | Light Liquid | 13 | - | 0.251 | 85% | 2.1 |
| | | | Heavy Liquid | - | 1 | 0.046 | 0% | 0.2 |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |

**Limetree Bay Terminals and Refining**
**B-16 Fugitives Annual Potential to Emit**

**Description**: fugitive emissions are quantified by the number, type of component and service (gas/vapor, light liquid, heavy liquid). The EPA "Protocol for Equipment Leak Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18), establish specific emission factors based on these variables and for different industrial activities. The TCEQ guidance also provides control efficiencies credits that can be applied to account for the reduction of emissions with the implementation of different LDAR programs. The TCEQ emission factors for refineries (Table II)are used for the emission calculations for all component types except for components in MDEA amine, ammopure and ammonia service, for which the TCEQ SOCMI Average emission factors (Table I) are used. The TCEQ emission factors are identical to the 1995 EPA published emission factors. The emission estimates are based on the assumption that all piping components have the potential to emit at all times (8,760 hr/yr). Limetree LDAR program has a leak definition for refinery pumps of 2,000 ppm VOC and for refinery valves of 500 ppm VOC per Consent Decree ¶109. All equipment is monitored quaterly. This meets the requirements of the 28VHP LDAR program as established in the TCEQ guidance (Table III). Therefore, for monitored components, emissions calculations include a reduction credit based on the TCEQ proposed monitoring control efficiency for the 28 VHP LDAR Program (Table V). Equipment marked with "ɫ" indicate that though it was previously not monitored it is required under current regulation to be monitored, and therefore, for PTE calculations it is capturedas monitored equipment.

**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| 2 UNIFINER | Area 2 | Valves | Gas/Vapor | - | - | 0.059 | 97% | - |
| | | | Light Liquid | 309 | - | 0.024 | 97% | 1.0 |
| | | | Heavy Liquid | - | - | 0.0005 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0089 | 97% | - |
| | | Connectors | Gas/Vapor | - | - | 0.00055 | 30% | - |
| | | | Light Liquid | 596 | - | 0.00055 | 30% | 1.0 |
| | | | Heavy Liquid | - | - | 0.00055 | 30% | - |
| | | | LL (SOCMI) | - | - | 0.0005 | 30% | - |
| | | Pressure Relief Valves | Gas/Vapor | 3 | - | 0.35 | 97% | 0.1 |
| | | Pressure Relief Valves ɫ | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | 7 | - | 0.251 | 85% | 1.2 |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |
| 3 PLAT / 3 HYDROBON | Area 4 | Valves | Gas/Vapor | 661 | - | 0.059 | 97% | 5.1 |
| | | | Light Liquid | 849 | - | 0.024 | 97% | 2.7 |
| | | | Heavy Liquid | - | 276 | 0.0005 | 0% | 0.6 |
| | | | LL (SOCMI) | - | 43 | 0.0089 | 97% | 1.7 |
| | | Connectors | Gas/Vapor | 24 | - | 0.00055 | 30% | 0.04 |
| | | | Light Liquid | 1,357 | 720 | 0.00055 | 30% | 4.0 |
| | | | Heavy Liquid | - | 828 | 0.00055 | 30% | 2.0 |
| | | | LL (SOCMI) | - | 129 | 0.0005 | 30% | 0.3 |
| | | Pressure Relief Valves | Gas/Vapor | 11 | - | 0.35 | 97% | 0.5 |
| | | Pressure Relief Valves ɫ | Gas/Vapor | - | 1 | 0.35 | 97% | 0.05 |
| | | Compressor seals | Gas/Vapor | 3 | - | 1.399 | 85% | 2.8 |
| | | Pump seals | Light Liquid | 11 | - | 0.251 | 85% | 1.8 |
| | | | Heavy Liquid | - | 1 | 0.046 | 0% | 0.2 |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |

**Limetree Bay Terminals and Refining**
**B-16 Fugitives Annual Potential to Emit**

**Description**: fugitive emissions are quantified by the number, type of component and service (gas/vapor, light liquid, heavy liquid). The EPA "Protocol for Equipment Leak Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18), establish specific emission factors based on these variables and for different industrial activities. The TCEQ guidance also provides control efficiencies credits that can be applied to account for the reduction of emissions with the implementation of different LDAR programs. The TCEQ emission factors for refineries (Table II)are used for the emission calculations for all component types except for components in MDEA amine, ammopure and ammonia service, for which the TCEQ SOCMI Average emission factors (Table I) are used. The TCEQ emission factors are identical to the 1995 EPA published emission factors. The emission estimates are based on the assumption that all piping components have the potential to emit at all times (8,760 hr/yr). Limetree LDAR program has a leak definition for refinery pumps of 2,000 ppm VOC and for refinery valves of 500 ppm VOC per Consent Decree ¶109. All equipment is monitored quaterly. This meets the requirements of the 28VHP LDAR program as established in the TCEQ guidance (Table III). Therefore, for monitored components, emissions calculations include a reduction credit based on the TCEQ proposed monitoring control efficiency for the 28 VHP LDAR Program (Table V). Equipment marked with "ł" indicate that though it was previously not monitored it is required under current regulation to be monitored, and therefore, for PTE calculations it is capturedas monitored equipment.

**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| 3 NAPHTHA UNIFINER | Area 4 | Valves | Gas/Vapor | - | - | 0.059 | 97% | - |
| | | | Light Liquid | 578 | - | 0.024 | 97% | 1.8 |
| | | | Heavy Liquid | - | - | 0.0005 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0089 | 97% | - |
| | | Connectors | Gas/Vapor | - | - | 0.00055 | 30% | - |
| | | | Light Liquid | 1,093 | - | 0.00055 | 30% | 1.8 |
| | | | Heavy Liquid | - | - | 0.00055 | 30% | - |
| | | | LL (SOCMI) | - | - | 0.0005 | 30% | - |
| | | Pressure Relief Valves | Gas/Vapor | 5 | - | 0.35 | 97% | 0.2 |
| | | Pressure Relief Valves ł | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | 2 | - | 1.399 | 85% | 1.8 |
| | | Pump seals | Light Liquid | 6 | - | 0.251 | 85% | 1.0 |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |
| 4 PLAT / 4 HYDROBON | Area 4 | Valves | Gas/Vapor | 682 | - | 0.059 | 97% | 5.3 |
| | | | Light Liquid | 838 | - | 0.024 | 97% | 2.6 |
| | | | Heavy Liquid | - | 276 | 0.0005 | 0% | 0.6 |
| | | | LL (SOCMI) | - | 43 | 0.0089 | 97% | 1.7 |
| | | Connectors | Gas/Vapor | 38 | - | 0.00055 | 30% | 0.06 |
| | | | Light Liquid | 1,219 | 720 | 0.00055 | 30% | 3.8 |
| | | | Heavy Liquid | - | 828 | 0.00055 | 30% | 2.0 |
| | | | LL (SOCMI) | - | 129 | 0.0005 | 30% | 0.3 |
| | | Pressure Relief Valves | Gas/Vapor | 12 | - | 0.35 | 97% | 0.6 |
| | | Pressure Relief Valves ł | Gas/Vapor | - | 1 | 0.35 | 97% | 0.05 |
| | | Compressor seals | Gas/Vapor | 4 | - | 1.399 | 85% | 3.7 |
| | | Pump seals | Light Liquid | 10 | - | 0.251 | 85% | 1.6 |
| | | | Heavy Liquid | - | 1 | 0.046 | 0% | 0.2 |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |

**Limetree Bay Terminals and Refining**
**B-16 Fugitives Annual Potential to Emit**

**Description**: fugitive emissions are quantified by the number, type of component and service (gas/vapor, light liquid, heavy liquid). The EPA "Protocol for Equipment Leak Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18), establish specific emission factors based on these variables and for different industrial activities. The TCEQ guidance also provides control efficiencies credits that can be applied to account for the reduction of emissions with the implementation of different LDAR programs. The TCEQ emission factors for refineries (Table II)are used for the emission calculations for all component types except for components in MDEA amine, ammopure and ammonia service, for which the TCEQ SOCMI Average emission factors (Table I) are used. The TCEQ emission factors are identical to the 1995 EPA published emission factors. The emission estimates are based on the assumption that all piping components have the potential to emit at all times (8,760 hr/yr). Limetree LDAR program has a leak definition for refinery pumps of 2,000 ppm VOC and for refinery valves of 500 ppm VOC per Consent Decree ¶109. All equipment is monitored quaterly. This meets the requirements of the 28VHP LDAR program as established in the TCEQ guidance (Table III). Therefore, for monitored components, emissions calculations include a reduction credit based on the TCEQ proposed monitoring control efficiency for the 28 VHP LDAR Program (Table V). Equipment marked with "ƚ" indicate that though it was previously not monitored it is required under current regulation to be monitored, and therefore, for PTE calculations it is capturedas monitored equipment.

**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| 4 NAPHTHA UNIFINER | Area 4 | Valves | Gas/Vapor | - | - | 0.059 | 97% | - |
| | | | Light Liquid | 647 | - | 0.024 | 97% | 2.0 |
| | | | Heavy Liquid | - | - | 0.0005 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0089 | 97% | - |
| | | Connectors | Gas/Vapor | - | - | 0.00055 | 30% | - |
| | | | Light Liquid | 1,194 | - | 0.00055 | 30% | 2.0 |
| | | | Heavy Liquid | - | - | 0.00055 | 30% | - |
| | | | LL (SOCMI) | - | - | 0.0005 | 30% | - |
| | | Pressure Relief Valves | Gas/Vapor | 8 | - | 0.35 | 97% | 0.4 |
| | | Pressure Relief Valves ƚ | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | 2 | - | 1.399 | 85% | 1.8 |
| | | Pump seals | Light Liquid | 6 | - | 0.251 | 85% | 1.0 |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |
| LSG | Area 4 | Valves | Gas/Vapor | 965 | - | 0.059 | 97% | 7.5 |
| | | | Light Liquid | 1,244 | - | 0.024 | 97% | 3.9 |
| | | | Heavy Liquid | - | - | 0.0005 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0089 | 97% | - |
| | | Connectors | Gas/Vapor | 1,581 | - | 0.00055 | 30% | 2.67 |
| | | | Light Liquid | 2,304 | - | 0.00055 | 30% | 3.9 |
| | | | Heavy Liquid | - | - | 0.00055 | 30% | - |
| | | | LL (SOCMI) | - | - | 0.0005 | 30% | - |
| | | Pressure Relief Valves | Gas/Vapor | 21 | - | 0.35 | 97% | 1.0 |
| | | Pressure Relief Valves ƚ | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | 4 | - | 1.399 | 85% | 3.7 |
| | | Pump seals | Light Liquid | 6 | - | 0.251 | 85% | 1.0 |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |

**Limetree Bay Terminals and Refining**
**B-16 Fugitives Annual Potential to Emit**

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**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| 2 SULFOLANE | Area 3 | Valves | Gas/Vapor | 359 | - | 0.059 | 97% | 2.8 |
| | | | Light Liquid | 2,478 | - | 0.024 | 97% | 7.8 |
| | | | Heavy Liquid | - | 66 | 0.0005 | 0% | 0.1 |
| | | | LL (SOCMI) | - | - | 0.0089 | 97% | - |
| | | Connectors | Gas/Vapor | 14 | - | 0.00055 | 30% | 0.02 |
| | | | Light Liquid | 6,190 | 1,778 | 0.00055 | 30% | 14.7 |
| | | | Heavy Liquid | - | 198 | 0.00055 | 30% | 0.5 |
| | | | LL (SOCMI) | - | - | 0.0005 | 30% | - |
| | | Pressure Relief Valves | Gas/Vapor | 28 | - | 0.35 | 97% | 1.3 |
| | | Pressure Relief Valves ƚ | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | 46 | - | 0.251 | 85% | 7.6 |
| | | | Heavy Liquid | - | 3 | 0.046 | 0% | 0.5 |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | 1 | 0.033 | 0% | 0.2 |
| DISULFIDE | Area 4 | Valves | Gas/Vapor | - | - | 0.059 | 97% | - |
| | | | Light Liquid | - | - | 0.024 | 97% | - |
| | | | Heavy Liquid | - | - | 0.0005 | 0% | - |
| | | | LL (SOCMI) | - | 56 | 0.0089 | 97% | 2.2 |
| | | Connectors | Gas/Vapor | - | - | 0.00055 | 30% | - |
| | | | Light Liquid | - | 121 | 0.00055 | 30% | 0.3 |
| | | | Heavy Liquid | - | - | 0.00055 | 30% | - |
| | | | LL (SOCMI) | - | 168 | 0.0005 | 30% | 0.4 |
| | | Pressure Relief Valves | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Pressure Relief Valves ƚ | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | - | - | 0.251 | 85% | - |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |

**Limetree Bay Terminals and Refining**
**B-16 Fugitives Annual Potential to Emit**

**Description**: fugitive emissions are quantified by the number, type of component and service (gas/vapor, light liquid, heavy liquid). The EPA "Protocol for Equipment Leak Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18), establish specific emission factors based on these variables and for different industrial activities. The TCEQ guidance also provides control efficiencies credits that can be applied to account for the reduction of emissions with the implementation of different LDAR programs. The TCEQ emission factors for refineries (Table II)are used for the emission calculations for all component types except for components in MDEA amine, ammopure and ammonia service, for which the TCEQ SOCMI Average emission factors (Table I) are used. The TCEQ emission factors are identical to the 1995 EPA published emission factors. The emission estimates are based on the assumption that all piping components have the potential to emit at all times (8,760 hr/yr). Limetree LDAR program has a leak definition for refinery pumps of 2,000 ppm VOC and for refinery valves of 500 ppm VOC per Consent Decree ¶109. All equipment is monitored quaterly. This meets the requirements of the 28VHP LDAR program as established in the TCEQ guidance (Table III). Therefore, for monitored components, emissions calculations include a reduction credit based on the TCEQ proposed monitoring control efficiency for the 28 VHP LDAR Program (Table V). Equipment marked with "ł" indicate that though it was previously not monitored it is required under current regulation to be monitored, and therefore, for PTE calculations it is capturedas monitored equipment.

**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| NAP FRAC. | Area 2 | Valves | Gas/Vapor | 124 | - | 0.059 | 97% | 1.0 |
| | | | Light Liquid | 428 | - | 0.024 | 97% | 1.3 |
| | | | Heavy Liquid | - | 71 | 0.0005 | 0% | 0.2 |
| | | | LL (SOCMI) | - | 32 | 0.0089 | 97% | 1.2 |
| | | Connectors | Gas/Vapor | 6 | - | 0.00055 | 30% | 0.01 |
| | | | Light Liquid | 632 | - | 0.00055 | 30% | 1.1 |
| | | | Heavy Liquid | - | 213 | 0.00055 | 30% | 0.5 |
| | | | LL (SOCMI) | - | 96 | 0.0005 | 30% | 0.2 |
| | | Pressure Relief Valves | Gas/Vapor | 8 | - | 0.35 | 97% | 0.4 |
| | | Pressure Relief Valves ł | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | 6 | - | 0.251 | 85% | 1.0 |
| | | | Heavy Liquid | - | 1 | 0.046 | 0% | 0.3 |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | 1 | 0.033 | 0% | 0.1 |
| DEISO-HEXANIZER | Area 3 | Valves | Gas/Vapor | - | - | 0.059 | 97% | - |
| | | | Light Liquid | 296 | - | 0.024 | 97% | 0.9 |
| | | | Heavy Liquid | - | - | 0.0005 | 0% | - |
| | | | LL (SOCMI) | - | 10 | 0.0089 | 97% | 0.4 |
| | | Connectors | Gas/Vapor | - | - | 0.00055 | 30% | - |
| | | | Light Liquid | 551 | - | 0.00055 | 30% | 0.9 |
| | | | Heavy Liquid | - | - | 0.00055 | 30% | - |
| | | | LL (SOCMI) | - | 30 | 0.0005 | 30% | 0.1 |
| | | Pressure Relief Valves | Gas/Vapor | 1 | - | 0.35 | 97% | 0.0 |
| | | Pressure Relief Valves ł | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | 10 | - | 0.251 | 85% | 1.6 |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |

**Limetree Bay Terminals and Refining**
**B-16 Fugitives Annual Potential to Emit**

**Description**: fugitive emissions are quantified by the number, type of component and service (gas/vapor, light liquid, heavy liquid). The EPA "Protocol for Equipment Leak Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18), establish specific emission factors based on these variables and for different industrial activities. The TCEQ guidance also provides control efficiencies credits that can be applied to account for the reduction of emissions with the implementation of different LDAR programs. The TCEQ emission factors for refineries (Table II)are used for the emission calculations for all component types except for components in MDEA amine, ammopure and ammonia service, for which the TCEQ SOCMI Average emission factors (Table I) are used. The TCEQ emission factors are identical to the 1995 EPA published emission factors. The emission estimates are based on the assumption that all piping components have the potential to emit at all times (8,760 hr/yr). Limetree LDAR program has a leak definition for refinery pumps of 2,000 ppm VOC and for refinery valves of 500 ppm VOC per Consent Decree ¶109. All equipment is monitored quaterly. This meets the requirements of the 28VHP LDAR program as established in the TCEQ guidance (Table III). Therefore, for monitored components, emissions calculations include a reduction credit based on the TCEQ proposed monitoring control efficiency for the 28 VHP LDAR Program (Table V). Equipment marked with "ɫ" indicate that though it was previously not monitored it is required under current regulation to be monitored, and therefore, for PTE calculations it is capturedas monitored equipment.

**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| AMINE (3,4,5 & T-931) | Area 1 / Area 3 | Valves | Gas/Vapor | 666 | - | 0.059 | 97% | 5.2 |
| | | | Light Liquid | 57 | - | 0.024 | 97% | 0.2 |
| | | | Heavy Liquid | - | - | 0.0005 | 0% | - |
| | | | G/V (SOCMI) | - | 103 | 0.0132 | 97% | 6.0 |
| | | | LL (SOCMI) | - | 192 | 0.0089 | 97% | 7.5 |
| | | | HL (SOCMI) | - | 660 | 0.0005 | 0% | 1.4 |
| | | Connectors | Gas/Vapor | 534 | - | 0.00055 | 30% | 0.90 |
| | | | Light Liquid | 83 | - | 0.00055 | 30% | 0.1 |
| | | | Heavy Liquid | - | - | 0.00055 | 30% | - |
| | | | G/V (SOCMI) | - | 309 | 0.0039 | 0% | 5.3 |
| | | | LL (SOCMI) | - | 576 | 0.0005 | 30% | 1.3 |
| | | | HL (SOCMI) | - | 1,980 | 0.00007 | 30% | 0.6 |
| | | Pressure Relief Valves | Gas/Vapor | 15 | - | 0.35 | 97% | 0.7 |
| | | Pressure Relief Valves ɫ | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | | G/V (SOCMI) | - | 2 | 0.2293 | 97% | 2.0 |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | 3 | - | 0.251 | 85% | 0.5 |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | | HL (SOCMI) | - | 5 | 0.019 | 0% | 0.4 |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |
| MEROX | FCC Complex | Valves | Gas/Vapor | - | - | 0.059 | 97% | - |
| | | | Light Liquid | 1,005 | - | 0.024 | 97% | 3.2 |
| | | | Heavy Liquid | - | - | 0.0005 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0089 | 97% | - |
| | | | HL (SOCMI) | - | 62 | 0.0005 | 0% | 0.1 |
| | | Connectors | Gas/Vapor | - | - | 0.00055 | 30% | - |
| | | | Light Liquid | 1,366 | - | 0.00055 | 30% | 2.3 |
| | | | Heavy Liquid | - | - | 0.00055 | 30% | - |
| | | | LL (SOCMI) | - | - | 0.0005 | 30% | - |
| | | | HL (SOCMI) | - | 186 | 0.00007 | 30% | 0.1 |
| | | Pressure Relief Valves | Gas/Vapor | 10 | - | 0.35 | 97% | 0.5 |
| | | Pressure Relief Valves ɫ | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | 4 | - | 0.251 | 85% | 0.7 |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |

**Limetree Bay Terminals and Refining**
**B-16 Fugitives Annual Potential to Emit**

**Description**: fugitive emissions are quantified by the number, type of component and service (gas/vapor, light liquid, heavy liquid). The EPA "Protocol for Equipment Leak Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18), establish specific emission factors based on these variables and for different industrial activities. The TCEQ guidance also provides control efficiencies credits that can be applied to account for the reduction of emissions with the implementation of different LDAR programs. The TCEQ emission factors for refineries (Table II)are used for the emission calculations for all component types except for components in MDEA amine, ammopure and ammonia service, for which the TCEQ SOCMI Average emission factors (Table I) are used. The TCEQ emission factors are identical to the 1995 EPA published emission factors. The emission estimates are based on the assumption that all piping components have the potential to emit at all times (8,760 hr/yr). Limetree LDAR program has a leak definition for refinery pumps of 2,000 ppm VOC and for refinery valves of 500 ppm VOC per Consent Decree ¶109. All equipment is monitored quaterly. This meets the requirements of the 28VHP LDAR program as established in the TCEQ guidance (Table III). Therefore, for monitored components, emissions calculations include a reduction credit based on the TCEQ proposed monitoring control efficiency for the 28 VHP LDAR Program (Table V). Equipment marked with "ƚ" indicate that though it was previously not monitored it is required under current regulation to be monitored, and therefore, for PTE calculations it is capturedas monitored equipment.

**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| 1&2 GRU/H2 CON | Area 2 / Area 3 | Valves | Gas/Vapor | 519 | - | 0.059 | 97% | 4.0 |
| | | | Light Liquid | 246 | - | 0.024 | 97% | 0.8 |
| | | | Heavy Liquid | - | 293 | 0.0005 | 0% | 0.7 |
| | | | LL (SOCMI) | - | 58 | 0.0089 | 97% | 2.3 |
| | | | HL (SOCMI) | - | 188 | 0.0005 | 0% | 0.4 |
| | | Connectors | Gas/Vapor | 38 | 1,075 | 0.00055 | 30% | 2.65 |
| | | | Light Liquid | 307 | - | 0.00055 | 30% | 0.5 |
| | | | Heavy Liquid | - | 879 | 0.00055 | 30% | 2.1 |
| | | | LL (SOCMI) | - | 174 | 0.0005 | 30% | 0.4 |
| | | | HL (SOCMI) | - | 564 | 0.00007 | 30% | 0.2 |
| | | Pressure Relief Valves | Gas/Vapor | 12 | - | 0.35 | 97% | 0.6 |
| | | Pressure Relief Valves ƚ | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | 6 | - | 1.399 | 85% | 5.5 |
| | | Pump seals | Light Liquid | 6 | - | 0.251 | 85% | 1.0 |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |
| 1&2 LPG TREATER | Area 3 | Valves | Gas/Vapor | - | - | 0.059 | 97% | - |
| | | | Light Liquid | - | - | 0.024 | 97% | - |
| | | | Heavy Liquid | - | - | 0.0005 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0089 | 97% | - |
| | | | HL (SOCMI) | - | 92 | 0.0005 | 0% | 0.2 |
| | | Connectors | Gas/Vapor | - | 826 | 0.00055 | 30% | 1.99 |
| | | | Light Liquid | - | - | 0.00055 | 30% | - |
| | | | Heavy Liquid | - | - | 0.00055 | 30% | - |
| | | | LL (SOCMI) | - | - | 0.0005 | 30% | - |
| | | | HL (SOCMI) | - | 276 | 0.00007 | 30% | 0.1 |
| | | Pressure Relief Valves | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Pressure Relief Valves ƚ | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | - | - | 0.251 | 85% | - |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |

**Limetree Bay Terminals and Refining**
**B-16 Fugitives Annual Potential to Emit**

**Description**: fugitive emissions are quantified by the number, type of component and service (gas/vapor, light liquid, heavy liquid). The EPA "Protocol for Equipment Leak Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18), establish specific emission factors based on these variables and for different industrial activities. The TCEQ guidance also provides control efficiencies credits that can be applied to account for the reduction of emissions with the implementation of different LDAR programs. The TCEQ emission factors for refineries (Table II)are used for the emission calculations for all component types except for components in MDEA amine, ammopure and ammonia service, for which the TCEQ SOCMI Average emission factors (Table I) are used. The TCEQ emission factors are identical to the 1995 EPA published emission factors. The emission estimates are based on the assumption that all piping components have the potential to emit at all times (8,760 hr/yr). Limetree LDAR program has a leak definition for refinery pumps of 2,000 ppm VOC and for refinery valves of 500 ppm VOC per Consent Decree ¶109. All equipment is monitored quaterly. This meets the requirements of the 28VHP LDAR program as established in the TCEQ guidance (Table III). Therefore, for monitored components, emissions calculations include a reduction credit based on the TCEQ proposed monitoring control efficiency for the 28 VHP LDAR Program (Table V). Equipment marked with "ł" indicate that though it was previously not monitored it is required under current regulation to be monitored, and therefore, for PTE calculations it is capturedas monitored equipment.

**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| 3 LPG FRAC | Area 3 | Valves | Gas/Vapor | - | - | 0.059 | 97% | - |
| | | | Light Liquid | - | - | 0.024 | 97% | - |
| | | | Heavy Liquid | - | - | 0.0005 | 0% | - |
| | | | LL (SOCMI) | - | 36 | 0.0089 | 97% | 1.4 |
| | | Connectors | Gas/Vapor | - | 826 | 0.00055 | 30% | 1.99 |
| | | | Light Liquid | - | - | 0.00055 | 30% | - |
| | | | Heavy Liquid | - | - | 0.00055 | 30% | - |
| | | | LL (SOCMI) | - | 108 | 0.0005 | 30% | 0.2 |
| | | Pressure Relief Valves | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Pressure Relief Valves ł | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | - | - | 0.251 | 85% | - |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |
| FCC & GASCON | FCC Complex | Valves | Gas/Vapor | - | - | 0.059 | 97% | - |
| | | | Light Liquid | 4,854 | - | 0.024 | 97% | 15.3 |
| | | | Heavy Liquid | - | 1,587 | 0.0005 | 0% | 3.5 |
| | | | G/V (SOCMI) | - | 9 | 0.0132 | 97% | 0.5 |
| | | | LL (SOCMI) | - | 138 | 0.0089 | 97% | 5.4 |
| | | Connectors | Gas/Vapor | 2 | - | 0.00055 | 30% | 0.00 |
| | | | Light Liquid | 7,230 | 1,923 | 0.00055 | 30% | 16.8 |
| | | | Heavy Liquid | - | 4,761 | 0.00055 | 30% | 11.5 |
| | | | G/V (SOCMI) | - | 27 | 0.0039 | 0% | 0.5 |
| | | | LL (SOCMI) | - | 414 | 0.0005 | 30% | 0.9 |
| | | Pressure Relief Valves | Gas/Vapor | 52 | - | 0.35 | 97% | 2.4 |
| | | Pressure Relief Valves ł | Gas/Vapor | - | 2 | 0.35 | 97% | 0.09 |
| | | Compressor seals | Gas/Vapor | 3 | - | 1.399 | 85% | 2.8 |
| | | Pump seals | Light Liquid | 50 | - | 0.251 | 85% | 8.2 |
| | | | Heavy Liquid | - | 5 | 0.046 | 0% | 1.0 |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | 1 | 0.033 | 0% | 0.1 |

**Limetree Bay Terminals and Refining**
**B-16 Fugitives Annual Potential to Emit**

**Description**: fugitive emissions are quantified by the number, type of component and service (gas/vapor, light liquid, heavy liquid). The EPA "Protocol for Equipment Leak Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18), establish specific emission factors based on these variables and for different industrial activities. The TCEQ guidance also provides control efficiencies credits that can be applied to account for the reduction of emissions with the implementation of different LDAR programs. The TCEQ emission factors for refineries (Table II)are used for the emission calculations for all component types except for components in MDEA amine, ammopure and ammonia service, for which the TCEQ SOCMI Average emission factors (Table I) are used. The TCEQ emission factors are identical to the 1995 EPA published emission factors. The emission estimates are based on the assumption that all piping components have the potential to emit at all times (8,760 hr/yr). Limetree LDAR program has a leak definition for refinery pumps of 2,000 ppm VOC and for refinery valves of 500 ppm VOC per Consent Decree ¶109. All equipment is monitored quaterly. This meets the requirements of the 28VHP LDAR program as established in the TCEQ guidance (Table III). Therefore, for monitored components, emissions calculations include a reduction credit based on the TCEQ proposed monitoring control efficiency for the 28 VHP LDAR Program (Table V). Equipment marked with "ł" indicate that though it was previously not monitored it is required under current regulation to be monitored, and therefore, for PTE calculations it is capturedas monitored equipment.

**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| DIMERSOL | FCC Complex | Valves | Gas/Vapor | - | - | 0.059 | 97% | - |
| | | | Light Liquid | 2,396 | - | 0.024 | 97% | 7.6 |
| | | | Heavy Liquid | - | - | 0.0005 | 0% | - |
| | | | LL (SOCMI) | - | 35 | 0.0089 | 1.0 | 1.4 |
| | | Connectors | Gas/Vapor | - | - | 0.00055 | 30% | - |
| | | | Light Liquid | 3,348 | - | 0.00055 | 30% | 5.6 |
| | | | Heavy Liquid | - | - | 0.00055 | 30% | - |
| | | | LL (SOCMI) | - | 105 | 0.0005 | 30% | 0.2 |
| | | Pressure Relief Valves | Gas/Vapor | 33 | - | 0.35 | 97% | 1.5 |
| | | Pressure Relief Valves ł | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | 33 | - | 0.251 | 85% | 5.4 |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | 5 | 0.0439 | 85% | 1.0 |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |
| 6 AMINE & SHU | FCC Complex | Valves | Gas/Vapor | - | - | 0.059 | 97% | - |
| | | | Light Liquid | - | - | 0.024 | 97% | - |
| | | | Heavy Liquid | - | - | 0.0005 | 0% | - |
| | | | G/V (SOCMI) | - | 30 | 0.0132 | 97% | 1.7 |
| | | | LL (SOCMI) | - | 92 | 0.0089 | 97% | 3.6 |
| | | | HL (SOCMI) | - | 583 | 0.0005 | 0% | 1.3 |
| | | Connectors | Gas/Vapor | - | - | 0.00055 | 30% | - |
| | | | Light Liquid | - | - | 0.00055 | 30% | - |
| | | | Heavy Liquid | - | - | 0.00055 | 30% | - |
| | | | G/V (SOCMI) | - | 90 | 0.0039 | 0% | 1.5 |
| | | | LL (SOCMI) | - | 276 | 0.0005 | 30% | 0.6 |
| | | | HL (SOCMI) | - | 1,749 | 0.00007 | 30% | 0.5 |
| | | Pressure Relief Valves | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | | G/V (SOCMI) | - | 1 | 0.2293 | 97% | 1.0 |
| | | Pressure Relief Valves ł | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | - | - | 0.251 | 85% | - |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | | HL (SOCMI) | - | 2 | 0.019 | 0% | 0.2 |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |

**Limetree Bay Terminals and Refining**
**B-16 Fugitives Annual Potential to Emit**

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**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| ALKY & ACID PLANT | FCC Complex | Valves | Gas/Vapor | 218 | - | 0.059 | 97% | 1.7 |
| | | | Light Liquid | 4,154 | - | 0.024 | 97% | 13.1 |
| | | | Heavy Liquid | - | - | 0.0005 | 0% | - |
| | | | G/V (SOCMI) | - | 372 | 0.0132 | 97% | 21.5 |
| | | | LL (SOCMI) | - | - | 0.0089 | 97% | - |
| | | Connectors | Gas/Vapor | 309 | - | 0.00055 | 30% | 0.52 |
| | | | Light Liquid | 4,339 | 229 | 0.00055 | 30% | 7.9 |
| | | | Heavy Liquid | - | - | 0.00055 | 30% | - |
| | | | G/V (SOCMI) | - | 1,116 | 0.0039 | 0% | 19.1 |
| | | | LL (SOCMI) | - | - | 0.0005 | 30% | - |
| | | Pressure Relief Valves | Gas/Vapor | 49 | - | 0.35 | 97% | 2.3 |
| | | Pressure Relief Valves ł | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | 2 | - | 1.399 | 85% | 1.8 |
| | | Pump seals | Light Liquid | 37 | - | 0.251 | 85% | 6.1 |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |
| LIGHT ENDS TREAT | FCC Complex | Valves | Gas/Vapor | 678 | - | 0.059 | 97% | 5.3 |
| | | | Light Liquid | 1,567 | - | 0.024 | 97% | 4.9 |
| | | | Heavy Liquid | - | - | 0.0005 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0089 | 97% | - |
| | | Connectors | Gas/Vapor | 254 | - | 0.00055 | 30% | 0.43 |
| | | | Light Liquid | 400 | - | 0.00055 | 30% | 0.7 |
| | | | Heavy Liquid | - | - | 0.00055 | 30% | - |
| | | | LL (SOCMI) | - | - | 0.0005 | 30% | - |
| | | Pressure Relief Valves | Gas/Vapor | 19 | - | 0.35 | 97% | 0.9 |
| | | Pressure Relief Valves ł | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | 20 | - | 0.251 | 85% | 3.3 |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |

## Limetree Bay Terminals and Refining
## B-16 Fugitives Annual Potential to Emit

**Description**: fugitive emissions are quantified by the number, type of component and service (gas/vapor, light liquid, heavy liquid). The EPA "Protocol for Equipment Leak Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18), establish specific emission factors based on these variables and for different industrial activities. The TCEQ guidance also provides control efficiencies credits that can be applied to account for the reduction of emissions with the implementation of different LDAR programs. The TCEQ emission factors for refineries (Table II)are used for the emission calculations for all component types except for components in MDEA amine, ammopure and ammonia service, for which the TCEQ SOCMI Average emission factors (Table I) are used. The TCEQ emission factors are identical to the 1995 EPA published emission factors. The emission estimates are based on the assumption that all piping components have the potential to emit at all times (8,760 hr/yr). Limetree LDAR program has a leak definition for refinery pumps of 2,000 ppm VOC and for refinery valves of 500 ppm VOC per Consent Decree ¶109. All equipment is monitored quaterly. This meets the requirements of the 28VHP LDAR program as established in the TCEQ guidance (Table III). Therefore, for monitored components, emissions calculations include a reduction credit based on the TCEQ proposed monitoring control efficiency for the 28 VHP LDAR Program (Table V). Equipment marked with "ŧ" indicate that though it was previously not monitored it is required under current regulation to be monitored, and therefore, for PTE calculations it is capturedas monitored equipment.

**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| MTBE | FCC Complex | Valves | Gas/Vapor | 157 | - | 0.059 | 97% | 1.2 |
| | | | Light Liquid | 1,130 | - | 0.024 | 97% | 3.6 |
| | | | Heavy Liquid | - | - | 0.0005 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0089 | 97% | - |
| | | Connectors | Gas/Vapor | 327 | - | 0.00055 | 30% | 0.55 |
| | | | Light Liquid | 2,195 | - | 0.00055 | 30% | 3.7 |
| | | | Heavy Liquid | - | - | 0.00055 | 30% | - |
| | | | LL (SOCMI) | - | - | 0.0005 | 30% | - |
| | | Pressure Relief Valves | Gas/Vapor | 19 | - | 0.35 | 97% | 0.9 |
| | | Pressure Relief Valves ŧ | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | 14 | - | 0.251 | 85% | 2.3 |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |
| TAME | FCC Complex | Valves | Gas/Vapor | 221 | - | 0.059 | 97% | 1.7 |
| | | | Light Liquid | 1,491 | - | 0.024 | 97% | 4.7 |
| | | | Heavy Liquid | - | - | 0.0005 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0089 | 97% | - |
| | | Connectors | Gas/Vapor | 329 | - | 0.00055 | 30% | 0.55 |
| | | | Light Liquid | 1,930 | - | 0.00055 | 30% | 3.3 |
| | | | Heavy Liquid | - | - | 0.00055 | 30% | - |
| | | | LL (SOCMI) | - | - | 0.0005 | 30% | - |
| | | Pressure Relief Valves | Gas/Vapor | 24 | - | 0.35 | 97% | 1.1 |
| | | Pressure Relief Valves ŧ | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | 24 | - | 0.251 | 85% | 4.0 |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |

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**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| SELECTIVE HYDRO | FCC Complex | Valves | Gas/Vapor | 278 | - | 0.059 | 97% | 2.2 |
| | | | Light Liquid | 1,353 | - | 0.024 | 97% | 4.3 |
| | | | Heavy Liquid | - | - | 0.0005 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0089 | 97% | - |
| | | Connectors | Gas/Vapor | 516 | - | 0.00055 | 30% | 0.87 |
| | | | Light Liquid | 1,720 | - | 0.00055 | 30% | 2.9 |
| | | | Heavy Liquid | - | - | 0.00055 | 30% | - |
| | | | LL (SOCMI) | - | - | 0.0005 | 30% | - |
| | | Pressure Relief Valves | Gas/Vapor | 25 | - | 0.35 | 97% | 1.1 |
| | | Pressure Relief Valves ł | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | 15 | - | 0.251 | 85% | 2.5 |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |
| 1 BEAVON / 1&2 SRU | West Sulfur Complex | Valves | Gas/Vapor | 310 | - | 0.059 | 97% | 2.4 |
| | | | Light Liquid | - | - | 0.024 | 97% | - |
| | | | Heavy Liquid | - | - | 0.0005 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0089 | 97% | - |
| | | Connectors | Gas/Vapor | 286 | - | 0.00055 | 30% | 0.48 |
| | | | Light Liquid | - | - | 0.00055 | 30% | - |
| | | | Heavy Liquid | - | - | 0.00055 | 30% | - |
| | | | LL (SOCMI) | - | - | 0.0005 | 30% | - |
| | | Pressure Relief Valves | Gas/Vapor | 3 | - | 0.35 | 97% | 0.1 |
| | | Pressure Relief Valves ł | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | - | - | 0.251 | 85% | - |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |

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**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| 2 BEAVON / 3&4 SRU | East Sulfur Complex | Valves | Gas/Vapor | 341 | - | 0.059 | 97% | 2.6 |
| | | | Light Liquid | - | - | 0.024 | 97% | - |
| | | | Heavy Liquid | - | - | 0.0005 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0089 | 97% | - |
| | | Connectors | Gas/Vapor | 104 | - | 0.00055 | 30% | 0.18 |
| | | | Light Liquid | - | - | 0.00055 | 30% | - |
| | | | Heavy Liquid | - | - | 0.00055 | 30% | - |
| | | | LL (SOCMI) | - | - | 0.0005 | 30% | - |
| | | Pressure Relief Valves | Gas/Vapor | 2 | - | 0.35 | 97% | 0.1 |
| | | Pressure Relief Valves ƚ | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | - | - | 0.251 | 85% | - |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |
| SRU | East & West Sulfur Complex | Valves | Gas/Vapor | - | - | 0.059 | 97% | - |
| | | | Light Liquid | - | - | 0.024 | 97% | - |
| | | | Heavy Liquid | - | - | 0.0005 | 0% | - |
| | | | G/V (SOCMI) | - | 362 | 0.0132 | 97% | 20.9 |
| | | | LL (SOCMI) | - | 87 | 0.0089 | 97% | 3.4 |
| | | Connectors | Gas/Vapor | - | - | 0.00055 | 30% | - |
| | | | Light Liquid | - | - | 0.00055 | 30% | - |
| | | | Heavy Liquid | - | - | 0.00055 | 30% | - |
| | | | G/V (SOCMI) | - | 1,086 | 0.0039 | 0% | 18.6 |
| | | | LL (SOCMI) | - | 261 | 0.0005 | 30% | 0.6 |
| | | Pressure Relief Valves | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Pressure Relief Valves ƚ | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | - | - | 0.251 | 85% | - |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |

**Limetree Bay Terminals and Refining**
**B-16 Fugitives Annual Potential to Emit**

**Description**: fugitive emissions are quantified by the number, type of component and service (gas/vapor, light liquid, heavy liquid). The EPA "Protocol for Equipment Leak Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18), establish specific emission factors based on these variables and for different industrial activities. The TCEQ guidance also provides control efficiencies credits that can be applied to account for the reduction of emissions with the implementation of different LDAR programs. The TCEQ emission factors for refineries (Table II)are used for the emission calculations for all component types except for components in MDEA amine, ammopure and ammonia service, for which the TCEQ SOCMI Average emission factors (Table I) are used. The TCEQ emission factors are identical to the 1995 EPA published emission factors. The emission estimates are based on the assumption that all piping components have the potential to emit at all times (8,760 hr/yr). Limetree LDAR program has a leak definition for refinery pumps of 2,000 ppm VOC and for refinery valves of 500 ppm VOC per Consent Decree ¶109. All equipment is monitored quaterly. This meets the requirements of the 28VHP LDAR program as established in the TCEQ guidance (Table III). Therefore, for monitored components, emissions calculations include a reduction credit based on the TCEQ proposed monitoring control efficiency for the 28 VHP LDAR Program (Table V). Equipment marked with "ƚ" indicate that though it was previously not monitored it is required under current regulation to be monitored, and therefore, for PTE calculations it is capturedas monitored equipment.

**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| 3 SWS | East Sulfur Complex | Valves | Gas/Vapor | - | - | 0.059 | 97% | - |
| | | | Light Liquid | - | - | 0.024 | 97% | - |
| | | | Heavy Liquid | - | - | 0.0005 | 0% | - |
| | | | LL (SOCMI) | - | 199 | 0.0089 | 97% | 7.8 |
| | | Connectors | Gas/Vapor | - | - | 0.00055 | 30% | - |
| | | | Light Liquid | - | - | 0.00055 | 30% | - |
| | | | Heavy Liquid | - | - | 0.00055 | 30% | - |
| | | | LL (SOCMI) | - | 597 | 0.0005 | 30% | 1.3 |
| | | Pressure Relief Valves | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Pressure Relief Valves ƚ | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | - | - | 0.251 | 85% | - |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | 3 | 0.0439 | 85% | 0.5 |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |
| 4 SWS | East Sulfur Complex | Valves | Gas/Vapor | - | - | 0.059 | 97% | - |
| | | | Light Liquid | - | - | 0.024 | 97% | - |
| | | | Heavy Liquid | - | - | 0.0005 | 0% | - |
| | | | LL (SOCMI) | - | 199 | 0.0089 | 97% | 7.8 |
| | | Connectors | Gas/Vapor | - | - | 0.00055 | 30% | - |
| | | | Light Liquid | - | - | 0.00055 | 30% | - |
| | | | Heavy Liquid | - | - | 0.00055 | 30% | - |
| | | | LL (SOCMI) | - | 597 | 0.0005 | 30% | 1.3 |
| | | Pressure Relief Valves | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Pressure Relief Valves ƚ | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | - | - | 0.251 | 85% | - |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |

**Limetree Bay Terminals and Refining**
**B-16 Fugitives Annual Potential to Emit**

**Description**: fugitive emissions are quantified by the number, type of component and service (gas/vapor, light liquid, heavy liquid). The EPA "Protocol for Equipment Leak Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18), establish specific emission factors based on these variables and for different industrial activities. The TCEQ guidance also provides control efficiencies credits that can be applied to account for the reduction of emissions with the implementation of different LDAR programs. The TCEQ emission factors for refineries (Table II)are used for the emission calculations for all component types except for components in MDEA amine, ammopure and ammonia service, for which the TCEQ SOCMI Average emission factors (Table I) are used. The TCEQ emission factors are identical to the 1995 EPA published emission factors. The emission estimates are based on the assumption that all piping components have the potential to emit at all times (8,760 hr/yr). Limetree LDAR program has a leak definition for refinery pumps of 2,000 ppm VOC and for refinery valves of 500 ppm VOC per Consent Decree ¶109. All equipment is monitored quaterly. This meets the requirements of the 28VHP LDAR program as established in the TCEQ guidance (Table III). Therefore, for monitored components, emissions calculations include a reduction credit based on the TCEQ proposed monitoring control efficiency for the 28 VHP LDAR Program (Table V). Equipment marked with "ł" indicate that though it was previously not monitored it is required under current regulation to be monitored, and therefore, for PTE calculations it is capturedas monitored equipment.

**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| 5 SWS | East Sulfur Complex | Valves | Gas/Vapor | - | - | 0.059 | 97% | - |
| | | | Light Liquid | - | - | 0.024 | 97% | - |
| | | | Heavy Liquid | - | - | 0.0005 | 0% | - |
| | | | G/V (SOCMI) | - | 46 | 0.0132 | 97% | 2.7 |
| | | | LL (SOCMI) | - | 271 | 0.0089 | 97% | 10.6 |
| | | Connectors | Gas/Vapor | - | - | 0.00055 | 30% | - |
| | | | Light Liquid | - | - | 0.00055 | 30% | - |
| | | | Heavy Liquid | - | - | 0.00055 | 30% | - |
| | | | G/V (SOCMI) | - | 138 | 0.0039 | 0% | 2.4 |
| | | | LL (SOCMI) | - | 813 | 0.0005 | 30% | 1.8 |
| | | Pressure Relief Valves | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Pressure Relief Valves ł | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | - | - | 0.251 | 85% | - |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | 3 | 0.0439 | 85% | 0.5 |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |
| 6 SWS | West Sulfur Complex | Valves | Gas/Vapor | 48 | - | 0.059 | 97% | 0.4 |
| | | | Light Liquid | 28 | - | 0.024 | 97% | 0.1 |
| | | | Heavy Liquid | - | - | 0.0005 | 0% | - |
| | | | G/V (SOCMI) | - | 46 | 0.0132 | 97% | 2.7 |
| | | | LL (SOCMI) | - | 271 | 0.0089 | 97% | 10.6 |
| | | Connectors | Gas/Vapor | 85 | - | 0.00055 | 30% | 0.14 |
| | | | Light Liquid | 52 | - | 0.00055 | 30% | 0.1 |
| | | | Heavy Liquid | - | - | 0.00055 | 30% | - |
| | | | G/V (SOCMI) | - | 138 | 0.0039 | 0% | 2.4 |
| | | | LL (SOCMI) | - | 813 | 0.0005 | 30% | 1.8 |
| | | Pressure Relief Valves | Gas/Vapor | 2 | - | 0.35 | 97% | 0.1 |
| | | Pressure Relief Valves ł | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | 2 | - | 0.251 | 85% | 0.3 |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | 3 | 0.0439 | 85% | 0.5 |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |

**Limetree Bay Terminals and Refining**
**B-16 Fugitives Annual Potential to Emit**

**Description**: fugitive emissions are quantified by the number, type of component and service (gas/vapor, light liquid, heavy liquid). The EPA "Protocol for Equipment Leak Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18), establish specific emission factors based on these variables and for different industrial activities. The TCEQ guidance also provides control efficiencies credits that can be applied to account for the reduction of emissions with the implementation of different LDAR programs. The TCEQ emission factors for refineries (Table II)are used for the emission calculations for all component types except for components in MDEA amine, ammopure and ammonia service, for which the TCEQ SOCMI Average emission factors (Table I) are used. The TCEQ emission factors are identical to the 1995 EPA published emission factors. The emission estimates are based on the assumption that all piping components have the potential to emit at all times (8,760 hr/yr). Limetree LDAR program has a leak definition for refinery pumps of 2,000 ppm VOC and for refinery valves of 500 ppm VOC per Consent Decree ¶109. All equipment is monitored quaterly. This meets the requirements of the 28VHP LDAR program as established in the TCEQ guidance (Table III). Therefore, for monitored components, emissions calculations include a reduction credit based on the TCEQ proposed monitoring control efficiency for the 28 VHP LDAR Program (Table V). Equipment marked with "ł" indicate that though it was previously not monitored it is required under current regulation to be monitored, and therefore, for PTE calculations it is capturedas monitored equipment.

**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| DELAYED COKER | Coker Complex | Valves | Gas/Vapor | 1,034 | - | 0.059 | 97% | 8.0 |
| | | | Light Liquid | 4,491 | - | 0.024 | 97% | 14.2 |
| | | | Heavy Liquid | - | 1,785 | 0.0005 | 0% | 4.0 |
| | | | LL (SOCMI) | - | - | 0.0089 | 97% | - |
| | | | HL (SOCMI) | - | 263 | 0.0005 | 0% | 0.6 |
| | | Connectors | Gas/Vapor | 1,742 | - | 0.00055 | 30% | 2.94 |
| | | | Light Liquid | 7,642 | - | 0.00055 | 30% | 12.9 |
| | | | Heavy Liquid | - | 5,354 | 0.00055 | 30% | 12.9 |
| | | | LL (SOCMI) | - | - | 0.0005 | 30% | - |
| | | | HL (SOCMI) | - | 789 | 0.00007 | 30% | 0.2 |
| | | Pressure Relief Valves | Gas/Vapor | 47 | - | 0.35 | 97% | 2.2 |
| | | Pressure Relief Valves ł | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | 1 | - | 1.399 | 85% | 0.9 |
| | | Pump seals | Light Liquid | 30 | - | 0.251 | 85% | 4.9 |
| | | | Heavy Liquid | - | 19 | 0.046 | 0% | 3.8 |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | 1 | 0.033 | 0% | 0.1 |
| BOILERS: E&W | Utility II & III | Valves | Gas/Vapor | - | - | 0.059 | 97% | - |
| | | | Light Liquid | - | - | 0.024 | 97% | - |
| | | | Heavy Liquid | - | 120 | 0.0005 | 0% | 0.3 |
| | | | LL (SOCMI) | - | - | 0.0089 | 97% | - |
| | | Connectors | Gas/Vapor | - | - | 0.00055 | 30% | - |
| | | | Light Liquid | - | - | 0.00055 | 30% | - |
| | | | Heavy Liquid | - | 360 | 0.00055 | 30% | 0.9 |
| | | | LL (SOCMI) | - | - | 0.0005 | 30% | - |
| | | Pressure Relief Valves | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Pressure Relief Valves ł | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | - | - | 0.251 | 85% | - |
| | | | Heavy Liquid | - | 5 | 0.046 | 0% | 1.0 |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | 2 | 0.033 | 0% | 0.4 |

**Limetree Bay Terminals and Refining**
**B-16 Fugitives Annual Potential to Emit**

**Description**: fugitive emissions are quantified by the number, type of component and service (gas/vapor, light liquid, heavy liquid). The EPA "Protocol for Equipment Leak Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18), establish specific emission factors based on these variables and for different industrial activities. The TCEQ guidance also provides control efficiencies credits that can be applied to account for the reduction of emissions with the implementation of different LDAR programs. The TCEQ emission factors for refineries (Table II)are used for the emission calculations for all component types except for components in MDEA amine, ammopure and ammonia service, for which the TCEQ SOCMI Average emission factors (Table I) are used. The TCEQ emission factors are identical to the 1995 EPA published emission factors. The emission estimates are based on the assumption that all piping components have the potential to emit at all times (8,760 hr/yr). Limetree LDAR program has a leak definition for refinery pumps of 2,000 ppm VOC and for refinery valves of 500 ppm VOC per Consent Decree ¶109. All equipment is monitored quaterly. This meets the requirements of the 28VHP LDAR program as established in the TCEQ guidance (Table III). Therefore, for monitored components, emissions calculations include a reduction credit based on the TCEQ proposed monitoring control efficiency for the 28 VHP LDAR Program (Table V). Equipment marked with "ŧ" indicate that though it was previously not monitored it is required under current regulation to be monitored, and therefore, for PTE calculations it is capturedas monitored equipment.

**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| UTILITIES & GT 1-9 | No. 1 & No. 2 POWERHOUSE | Valves | Gas/Vapor | - | - | 0.059 | 97% | - |
| | | | Light Liquid | - | - | 0.024 | 97% | - |
| | | | Heavy Liquid | - | 211 | 0.0005 | 0% | 0.5 |
| | | | LL (SOCMI) | - | - | 0.0089 | 97% | - |
| | | Connectors | Gas/Vapor | - | - | 0.00055 | 30% | - |
| | | | Light Liquid | - | - | 0.00055 | 30% | - |
| | | | Heavy Liquid | - | 633 | 0.00055 | 30% | 1.5 |
| | | | LL (SOCMI) | - | - | 0.0005 | 30% | - |
| | | Pressure Relief Valves | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Pressure Relief Valves ŧ | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | - | - | 0.251 | 85% | - |
| | | | Heavy Liquid | - | 4 | 0.046 | 0% | 0.8 |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | 2 | 0.033 | 0% | 0.3 |
| Utility II & No. 1 Powerhouse | Utility II & No. 1 Powerhouse | Valves | Gas/Vapor | 368 | - | 0.059 | 97% | 2.9 |
| | | | Light Liquid | 2 | - | 0.024 | 97% | 0.0 |
| | | | Heavy Liquid | - | - | 0.0005 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0089 | 97% | - |
| | | Connectors | Gas/Vapor | - | - | 0.00055 | 30% | - |
| | | | Light Liquid | - | - | 0.00055 | 30% | - |
| | | | Heavy Liquid | - | - | 0.00055 | 30% | - |
| | | | LL (SOCMI) | - | - | 0.0005 | 30% | - |
| | | Pressure Relief Valves | Gas/Vapor | 5 | - | 0.35 | 97% | 0.2 |
| | | Pressure Relief Valves ŧ | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | - | - | 0.251 | 85% | - |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |

**Limetree Bay Terminals and Refining**
**B-16 Fugitives Annual Potential to Emit**

**Description**: fugitive emissions are quantified by the number, type of component and service (gas/vapor, light liquid, heavy liquid). The EPA "Protocol for Equipment Leak Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18), establish specific emission factors based on these variables and for different industrial activities. The TCEQ guidance also provides control efficiencies credits that can be applied to account for the reduction of emissions with the implementation of different LDAR programs. The TCEQ emission factors for refineries (Table II)are used for the emission calculations for all component types except for components in MDEA amine, ammopure and ammonia service, for which the TCEQ SOCMI Average emission factors (Table I) are used. The TCEQ emission factors are identical to the 1995 EPA published emission factors. The emission estimates are based on the assumption that all piping components have the potential to emit at all times (8,760 hr/yr). Limetree LDAR program has a leak definition for refinery pumps of 2,000 ppm VOC and for refinery valves of 500 ppm VOC per Consent Decree ¶109. All equipment is monitored quaterly. This meets the requirements of the 28VHP LDAR program as established in the TCEQ guidance (Table III). Therefore, for monitored components, emissions calculations include a reduction credit based on the TCEQ proposed monitoring control efficiency for the 28 VHP LDAR Program (Table V). Equipment marked with "ł" indicate that though it was previously not monitored it is required under current regulation to be monitored, and therefore, for PTE calculations it is capturedas monitored equipment.

**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| Utility III & No. 2 Powerhouse | Utility III & No. 2 Powerhouse | Valves | Gas/Vapor | 900 | - | 0.059 | 97% | 7.0 |
| | | | Light Liquid | 169 | - | 0.024 | 97% | 0.5 |
| | | | Heavy Liquid | - | - | 0.0005 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0089 | 97% | - |
| | | Connectors | Gas/Vapor | 390 | - | 0.00055 | 30% | 0.66 |
| | | | Light Liquid | 44 | - | 0.00055 | 30% | 0.1 |
| | | | Heavy Liquid | - | - | 0.00055 | 30% | - |
| | | | LL (SOCMI) | - | - | 0.0005 | 30% | - |
| | | Pressure Relief Valves | Gas/Vapor | 13 | - | 0.35 | 97% | 0.6 |
| | | Pressure Relief Valves ł | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | - | - | 0.251 | 85% | - |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |
| EAST FUEL GAS SYSTEM | - | Valves | Gas/Vapor | 626 | - | 0.059 | 97% | 4.9 |
| | | | Light Liquid | 98 | - | 0.024 | 97% | 0.3 |
| | | | Heavy Liquid | - | - | 0.0005 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0089 | 97% | - |
| | | Connectors | Gas/Vapor | 174 | 5,590 | 0.00055 | 30% | 13.76 |
| | | | Light Liquid | 38 | - | 0.00055 | 30% | 0.1 |
| | | | Heavy Liquid | - | - | 0.00055 | 30% | - |
| | | | LL (SOCMI) | - | - | 0.0005 | 30% | - |
| | | Pressure Relief Valves | Gas/Vapor | 7 | - | 0.35 | 97% | 0.3 |
| | | Pressure Relief Valves ł | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | - | - | 0.251 | 85% | - |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |

**Limetree Bay Terminals and Refining**
**B-16 Fugitives Annual Potential to Emit**

**Description**: fugitive emissions are quantified by the number, type of component and service (gas/vapor, light liquid, heavy liquid). The EPA "Protocol for Equipment Leak Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18), establish specific emission factors based on these variables and for different industrial activities. The TCEQ guidance also provides control efficiencies credits that can be applied to account for the reduction of emissions with the implementation of different LDAR programs. The TCEQ emission factors for refineries (Table II)are used for the emission calculations for all component types except for components in MDEA amine, ammopure and ammonia service, for which the TCEQ SOCMI Average emission factors (Table I) are used. The TCEQ emission factors are identical to the 1995 EPA published emission factors. The emission estimates are based on the assumption that all piping components have the potential to emit at all times (8,760 hr/yr). Limetree LDAR program has a leak definition for refinery pumps of 2,000 ppm VOC and for refinery valves of 500 ppm VOC per Consent Decree ¶109. All equipment is monitored quaterly. This meets the requirements of the 28VHP LDAR program as established in the TCEQ guidance (Table III). Therefore, for monitored components, emissions calculations include a reduction credit based on the TCEQ proposed monitoring control efficiency for the 28 VHP LDAR Program (Table V). Equipment marked with "ł" indicate that though it was previously not monitored it is required under current regulation to be monitored, and therefore, for PTE calculations it is capturedas monitored equipment.

**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| WEST FUEL GAS SYSTEM | - | Valves | Gas/Vapor | 579 | - | 0.059 | 97% | 4.5 |
| | | | Light Liquid | 189 | - | 0.024 | 97% | 0.6 |
| | | | Heavy Liquid | - | - | 0.0005 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0089 | 97% | - |
| | | Connectors | Gas/Vapor | 156 | 5,590 | 0.00055 | 30% | 13.73 |
| | | | Light Liquid | 8 | - | 0.00055 | 30% | 0.0 |
| | | | Heavy Liquid | - | - | 0.00055 | 30% | - |
| | | | LL (SOCMI) | - | - | 0.0005 | 30% | - |
| | | Pressure Relief Valves | Gas/Vapor | 7 | - | 0.35 | 97% | 0.3 |
| | | Pressure Relief Valves ł | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | - | - | 0.251 | 85% | - |
| | | | Heavy Liquid | - | - | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | - | 0.033 | 0% | - |
| TERMINAL | Terminal | Valves | Gas/Vapor | 887 | - | 0.059 | 97% | 6.9 |
| | | | Light Liquid | 13,815 | - | 0.024 | 97% | 43.6 |
| | | | Heavy Liquid | - | 2,102 | 0.0005 | 0% | 4.7 |
| | | | LL (SOCMI) | - | - | 0.0089 | 97% | - |
| | | Connectors | Gas/Vapor | 1,087 | 3,841 | 0.00055 | 30% | 11.09 |
| | | | Light Liquid | 23,690 | 10,687 | 0.00055 | 30% | 65.7 |
| | | | Heavy Liquid | - | 6,743 | 0.00055 | 30% | 16.2 |
| | | | LL (SOCMI) | - | - | 0.0005 | 30% | - |
| | | Pressure Relief Valves | Gas/Vapor | 366 | - | 0.35 | 97% | 16.8 |
| | | Pressure Relief Valves ł | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | 5 | - | 1.399 | 85% | 4.6 |
| | | Pump seals | Light Liquid | 181 | - | 0.251 | 85% | 29.8 |
| | | | Heavy Liquid | - | 68 | 0.046 | 0% | 13.7 |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | 29 | 0.033 | 0% | 4.2 |

**Limetree Bay Terminals and Refining**
**B-16 Fugitives Annual Potential to Emit**

**Description**: fugitive emissions are quantified by the number, type of component and service (gas/vapor, light liquid, heavy liquid). The EPA "Protocol for Equipment Leak Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18), establish specific emission factors based on these variables and for different industrial activities. The TCEQ guidance also provides control efficiencies credits that can be applied to account for the reduction of emissions with the implementation of different LDAR programs. The TCEQ emission factors for refineries (Table II)are used for the emission calculations for all component types except for components in MDEA amine, ammopure and ammonia service, for which the TCEQ SOCMI Average emission factors (Table I) are used. The TCEQ emission factors are identical to the 1995 EPA published emission factors. The emission estimates are based on the assumption that all piping components have the potential to emit at all times (8,760 hr/yr). Limetree LDAR program has a leak definition for refinery pumps of 2,000 ppm VOC and for refinery valves of 500 ppm VOC per Consent Decree ¶109. All equipment is monitored quaterly. This meets the requirements of the 28VHP LDAR program as established in the TCEQ guidance (Table III). Therefore, for monitored components, emissions calculations include a reduction credit based on the TCEQ proposed monitoring control efficiency for the 28 VHP LDAR Program (Table V). Equipment marked with "ł" indicate that though it was previously not monitored it is required under current regulation to be monitored, and therefore, for PTE calculations it is capturedas monitored equipment.

**Table 2. Fugitive Equipment Leak Emissions Calculation**

| Unit | Area | Equipment Type | Service | Monitored Components Count | Unmonitored Components Count | Emission Factor (lb/hr/equip) | Monitoring Control Efficiency (28 VHP) | Annual Potential to Emit (tpy) |
|---|---|---|---|---|---|---|---|---|
| OFFSITES/RUNDOWNS/XFERS | Terminal | Valves | Gas/Vapor | - | - | 0.059 | 97% | - |
| | | | Light Liquid | - | - | 0.024 | 97% | - |
| | | | Heavy Liquid | - | 1,708 | 0.0005 | 0% | 3.8 |
| | | | LL (SOCMI) | - | - | 0.0089 | 97% | - |
| | | Connectors | Gas/Vapor | - | - | 0.00055 | 30% | - |
| | | | Light Liquid | - | - | 0.00055 | 30% | - |
| | | | Heavy Liquid | - | 5,124 | 0.00055 | 30% | 12.3 |
| | | | LL (SOCMI) | - | - | 0.0005 | 30% | - |
| | | Pressure Relief Valves | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Pressure Relief Valves ł | Gas/Vapor | - | - | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | - | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | - | - | 0.251 | 85% | - |
| | | | Heavy Liquid | - | 17 | 0.046 | 0% | 3.4 |
| | | | LL (SOCMI) | - | - | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | - | 0.0051 | 0% | - |
| | | | Light Liquid | - | - | 0.0051 | 0% | - |
| | | | Heavy Liquid | - | - | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | - | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | - | 0.033 | 0% | - |
| | | | Light Liquid | - | - | 0.033 | 0% | - |
| | | | Heavy Liquid | - | 8 | 0.033 | 0% | 1.1 |
| MARINE DOCKS | Terminal | Valves | Gas/Vapor | - | | 0.059 | 97% | - |
| | | | Light Liquid | 78 | | 0.024 | 97% | 0.2 |
| | | | Heavy Liquid | - | | 0.0005 | 0% | - |
| | | | LL (SOCMI) | - | | 0.0089 | 97% | - |
| | | Connectors | Gas/Vapor | - | | 0.00055 | 30% | - |
| | | | Light Liquid | 255 | | 0.00055 | 30% | 0.4 |
| | | | Heavy Liquid | - | | 0.00055 | 30% | - |
| | | | LL (SOCMI) | - | | 0.0005 | 30% | - |
| | | Pressure Relief Valves | Gas/Vapor | - | | 0.35 | 97% | - |
| | | Pressure Relief Valves ł | Gas/Vapor | - | | 0.35 | 97% | - |
| | | Compressor seals | Gas/Vapor | - | | 1.399 | 85% | - |
| | | Pump seals | Light Liquid | 6 | | 0.251 | 85% | 1.0 |
| | | | Heavy Liquid | - | | 0.046 | 0% | - |
| | | | LL (SOCMI) | - | | 0.0439 | 85% | - |
| | | Open-ended Lines | Gas/Vapor | - | | 0.0051 | 0% | - |
| | | | Light Liquid | 50 | | 0.0051 | 0% | 1.1 |
| | | | Heavy Liquid | - | | 0.0051 | 0% | - |
| | | | LL (SOCMI) | - | | 0.0038 | 0% | - |
| | | Sampling Connections | Gas/Vapor | - | | 0.033 | 0% | - |
| | | | Light Liquid | - | | 0.033 | 0% | - |
| | | | Heavy Liquid | - | | 0.033 | 0% | - |

## Limetree Bay Terminals and Refining
## B-17 Oily Water Collection System Annual Potential to Emit

**Description**: emissions from the wastewater collection system drains and junction boxes is quantified using the total counts of sewer cups and junction boxes as recorded in the facility inspection logs. Sewer cups are either equipped with caps/inserts or have cement plugs. Junction boxes can be equipped with a carbon cannister, a breather valve or have gas-tight covers. A general uncontrolled emission factor of 0.07 lb/hr/equipment as published by TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18) for process drains in refineries (Table II) was used in the emission calculations. Estimates are based on the assumption that all process drains and junction boxes were operational 8,760 hr/yr. Process drains equipped with a cement plug have no emissions. Process drains are visually inspected monthly and water traps are refilled as necessary. Junction boxes are inspected quarterly and appropriate measures are conducted if needed to ensure emissions controls. These controls reduce emissions of VOC from both process drains and junction boxes by about 95% in comparison to the emissions that would result in the absence of the control, as published in the "Industrial Wastewater Volatile Organic Compound Emissions - Background Information for BACT/LAER Determinations" EPA-450/3-90-004, January 1990.

**Table 1. Oily Water Collection System Annual Potential to Emit**

| Unit | Sewer Cups | | Junction Boxes | | | VOC Emissions (tpy) | | |
|---|---|---|---|---|---|---|---|---|
| | W/ Caps | W/ Cement Plugs | W/ Carbon Canisters | W/ Breather Valves | W/ Gas-Tight Cover | Sewer Cups | Junction Boxes | Total |
| West Refinery Oily Water | 927 | 104 | 19 | 59 | 29 | 14.2 | 1.6 | 15.9 |
| East Refinery Oily Water | 1,563 | 222 | 112 | 110 | 60 | 24.0 | 4.3 | 28.3 |
| FCC/DCU Oily Water | 970 | 5 | - | 46 | - | 14.9 | 0.7 | 15.6 |
| Terminal Oily Water | 183 | 51 | 21 | 6 | 60 | 2.8 | 1.3 | 4.1 |
| **TOTAL SITEWIDE** | **3,643** | **382** | **152** | **221** | **149** | **55.8** | **8.0** | **63.8** |

Notes:

(1) Calculations as provided in Tables 2 and 3

**Table 2. Process Drains Annual Potential to Emit by Unit**

| Area | Location | Sewer Cups | | Emission Factor (lb/hr/equip) | Control Efficiency | VOC Emissions (tpy) |
|---|---|---|---|---|---|---|
| | | W/ Caps | W/ Cement Plugs | | | |
| Area 1 | Tank Field No.3 | 6 | 4 | 0.07 | 95% | 0.09 |
| Area 1 | Penex | 29 | 9 | 0.07 | 95% | 0.44 |
| Area 1 | No. 3 Amine Unit | 19 | 4 | 0.07 | 95% | 0.29 |
| Area 1 | 2 CDU | 73 | 1 | 0.07 | 95% | 1.12 |
| Area 1 | 3 CDU | 64 | 3 | 0.07 | 95% | 0.98 |
| Area 1 | 1 VIS (2 DU FRAC) | 41 | 1 | 0.07 | 95% | 0.63 |
| Area 1 | 3 DD | 24 | - | 0.07 | 95% | 0.37 |
| Area 2 | No. 4 DD / No. 2 NAPHTHA FRAC. | 136 | 46 | 0.07 | 95% | 2.08 |
| Area 2 | 5 DD | 81 | 1 | 0.07 | 95% | 1.24 |
| Area 2 | No. 2 VACUUM UNIT | 85 | 4 | 0.07 | 95% | 1.30 |
| Area 2 | No. 2 Visbreaker Unit | 69 | 7 | 0.07 | 95% | 1.06 |
| Area 2 | No. 2 DD / H2 CONSERVATION | 64 | 13 | 0.07 | 95% | 0.98 |
| Area 2 | No. 1 GAS RECOVERY UNIT | 31 | 1 | 0.07 | 95% | 0.48 |
| Area 2 | No. 2 PLATFORMER UNIT | 74 | 3 | 0.07 | 95% | 1.13 |
| Area 2 | PUMP MANIFOLD SOUTH OF No. 2VIS / No. 2 VAC UNIT | 15 | - | 0.07 | 95% | 0.23 |
| Area 3 | 5 CDU | 158 | 6 | 0.07 | 95% | 2.42 |
| Area 3 | 6 CDU | 157 | 3 | 0.07 | 95% | 2.41 |
| Area 3 | 2 SULFOLANE | 91 | 31 | 0.07 | 95% | 1.40 |
| Area 3 | 2 GRU / 3 LPG FRAC | 78 | 6 | 0.07 | 95% | 1.20 |
| Area 3 | 1 LPG / DEISOPENTANIZER | 54 | 4 | 0.07 | 95% | 0.83 |

**Limetree Bay Terminals and Refining**
**B-17 Oily Water Collection System Annual Potential to Emit**

| | | | | | | |
|---|---|---|---|---|---|---|
| Area 3 | No. 4 & 5 AMINE UNITS | 45 | 9 | 0.07 | 95% | 0.69 |
| Area 4 | 6 DD | 108 | 26 | 0.07 | 95% | 1.66 |
| Area 4 | 7 DD | 93 | 20 | 0.07 | 95% | 1.43 |
| Area 4 | 9 DD | 62 | 22 | 0.07 | 95% | 0.95 |
| Area 4 | 3 Platformer | 117 | 19 | 0.07 | 95% | 1.79 |
| Area 4 | 4 Platformer | 122 | 26 | 0.07 | 95% | 1.87 |
| Area 4 | 3 VAC | 104 | 21 | 0.07 | 95% | 1.59 |
| Area 4 | DISULFIDE / NAPTHA FRAC | 9 | - | 0.07 | 95% | 0.14 |
| Area 4 | LSG | 103 | - | 0.07 | 95% | 1.58 |
| Area 5 | AMINE | 30 | - | 0.07 | 95% | 0.46 |
| Area 5 | Alkylation Unit | 81 | 1 | 0.07 | 95% | 1.24 |
| Area 5 | DIMERSOL | 108 | - | 0.07 | 95% | 1.66 |
| Area 5 | FCC Unit | 206 | - | 0.07 | 95% | 3.16 |
| Area 5 | GAS CON | 52 | - | 0.07 | 95% | 0.80 |
| Area 5 | MEROX Unit | 112 | - | 0.07 | 95% | 1.72 |
| Area 5 | MTBE | 55 | 1 | 0.07 | 95% | 0.84 |
| Area 5 | TAME UNIT | 59 | - | 0.07 | 95% | 0.90 |
| Area 5 | SELECT HYDRO | 59 | - | 0.07 | 95% | 0.90 |
| Area 5 | SAR Unit | 6 | 1 | 0.07 | 95% | 0.09 |
| Area 6 | No. 5 SOUR WATER STRIPPER | 22 | - | 0.07 | 95% | 0.34 |
| Area 6 | HP / LP FLARES | 7 | - | 0.07 | 95% | 0.11 |
| Area 6 | No. 6 SOUR WATER STRIPPER | 9 | - | 0.07 | 95% | 0.14 |
| Area 6 | HWWTP | 23 | - | 0.07 | 95% | 0.35 |
| Area 6 | EAST FLARE AREA | 9 | - | 0.07 | 95% | 0.14 |
| Area 6 | NO .1 WASTE WATER TREATMENT | 8 | - | 0.07 | 95% | 0.12 |
| Area 6 | NO. 2 WASTE WATER TREATMENT | 6 | - | 0.07 | 95% | 0.09 |
| Area 6 | NESHAP STRIPPER | 4 | 4 | 0.07 | 95% | 0.06 |
| Area 6 | BUNDLE WASH/FLARE | 5 | 7 | 0.07 | 95% | 0.08 |
| Area 6 | EAST API AREA | 17 | - | 0.07 | 95% | 0.26 |
| FCC Complex | GASCON | 61 | - | 0.07 | 95% | 0.94 |
| FCC Complex | FRAC BLOWDOWN | 61 | 2 | 0.07 | 95% | 0.94 |
| FCC Complex | LPG | 13 | - | 0.07 | 95% | 0.20 |
| FCC Complex | COKER | 67 | - | 0.07 | 95% | 1.03 |
| Utility II & No. 1 Powerhouse | WEST UTILITIES | 44 | 4 | 0.07 | 95% | 0.67 |
| Utility II & No. 1 Powerhouse | NO. 1 POWERHOUSE | 72 | 3 | 0.07 | 95% | 1.10 |
| Utility III & No. 2 Powerhouse | East Power Utilities: C-1 Operator | 5 | 5 | 0.07 | 95% | 0.08 |
| Utility III & No. 2 Powerhouse | East Power Utilities: C-1 Operator (Desal #4) | 6 | - | 0.07 | 95% | 0.09 |
| Utility III & No. 2 Powerhouse | East Power Utilities: C-2 Operator | 63 | 3 | 0.07 | 95% | 0.97 |
| Utility III & No. 2 Powerhouse | East Power Utilities: C-2 Operator (Powerhouse) | - | 9 | 0.07 | 95% | - |
| Utility III & No. 2 Powerhouse | East Power Utilities: C-3 Operator | 40 | - | 0.07 | 95% | 0.61 |
| Utility III & No. 2 Powerhouse | Gas Turbine 13: C-3 Operator | 38 | 1 | 0.07 | 95% | 0.58 |

| | | | | | | |
|---|---|---|---|---|---|---|
| TERMINAL | TRUCK RACK (W of Admin. Building) | 3 | - | 0.07 | 95% | 0.05 |
| TERMINAL | PUMP MANIFOLD WEST OF TANK 6804 | 3 | - | 0.07 | 95% | 0.05 |
| TERMINAL | PUMP MANIFOLD SOUTH OF SPHERE 6891 | 1 | - | 0.07 | 95% | 0.02 |
| TERMINAL | PUMP MANIFOLD NORTHEAST OF SPHERE 6866 | - | 4 | 0.07 | 95% | - |
| TERMINAL | PUMP MANIFOLD (south of Tank 7418) | 3 | - | 0.07 | 95% | 0.05 |
| TERMINAL | NO. 1 PUMP MANIFOLD (E of Tank 6821) | 20 | - | 0.07 | 95% | 0.31 |
| TERMINAL | NO. 2 PUMP MANIFOLD (west of Tank 7406) | 25 | - | 0.07 | 95% | 0.38 |
| TERMINAL | NO. 3 PUMP MANIFOLD (west of Tank 7428) | 9 | 2 | 0.07 | 95% | 0.14 |
| TERMINAL | NO. 4 PUMP MANIFOLD (west of Tank 7426) | 3 | - | 0.07 | 95% | 0.05 |
| TERMINAL | Tank Field No. 1 | 1 | - | 0.07 | 95% | 0.02 |
| TERMINAL | TANK FIELD NO.22 | 1 | - | 0.07 | 95% | 0.02 |
| TERMINAL | SCPC TANK FIELD | 6 | 15 | 0.07 | 95% | 0.09 |
| TERMINAL | FILL & CARGO PUMP MANIFOLD TKFLD 59 | - | 4 | 0.07 | 95% | - |
| TERMINAL | EAST CRUDE PUMP MANIFOLD (east of Tank 7511) TKFLD 59 | - | 4 | 0.07 | 95% | - |
| TERMINAL | BTX PUMP MANIFOLD (south of #2 DD Unit) | 16 | 11 | 0.07 | 95% | 0.25 |
| TERMINAL | BTX CARGO | 21 | 7 | 0.07 | 95% | 0.32 |
| TERMINAL | BTX & AGO CHARGE MANIFOLD (east of Tank 7448) | 6 | - | 0.07 | 95% | 0.09 |
| TERMINAL | NAPHTHA FUEL SUPPLY PUMP MANIFOLD (west of Tank 6836) | 2 | 2 | 0.07 | 95% | 0.03 |
| TERMINAL | NAPHTHA PUMP MANIFOLD (northeast of Tank 7443) | 10 | 2 | 0.07 | 95% | 0.15 |
| TERMINAL | CRUDE CHARGE PUMP MANIFOLD (west of TK7403) | 12 | - | 0.07 | 95% | 0.18 |
| TERMINAL | GASOLINE BLENDING | 33 | - | 0.07 | 95% | 0.51 |
| TERMINAL | BLACK OIL MANIFOLD (east of Tank 7415) | 8 | - | 0.07 | 95% | 0.12 |

**Table 3. Junction Boxes Annual Potential to Emit by Unit**

| Area | Location | Junction Boxes | | | Emission Factor (lb/hr/equip) | Control Efficiency | | | VOC Emissions (tpy) |
|---|---|---|---|---|---|---|---|---|---|
| | | W/ Carbon Canisters | W/ Breather Valves | W/ Gas-Tight Cover | | W/ Carbon Canisters | W/ Breather Valves | W/ Gas-Tight Cover | |
| Area 1 | 2 D.U. Product Frac | 1 | 1 | 3 | 0.07 | 95% | 95% | 95% | 0.08 |
| Area 1 | Penex Unit | 2 | 8 | 2 | 0.07 | 95% | 95% | 95% | 0.18 |
| Area 1 | No. 2 Crude Unit | 3 | 4 | 1 | 0.07 | 95% | 95% | 95% | 0.12 |
| Area 1 | No. 3 Crude Unit | 1 | 3 | 5 | 0.07 | 95% | 95% | 95% | 0.14 |
| Area 1 | No. 3 Distillate Unifiner | - | 2 | - | 0.07 | 95% | 95% | 95% | 0.03 |
| Area 1 | No. 3 Amine Unit | - | - | 1 | 0.07 | 95% | 95% | 95% | 0.02 |
| Area 2 | No. 2 Platformer Unit | 1 | 6 | 8 | 0.07 | 95% | 95% | 95% | 0.23 |
| Area 2 | No. 5 DD Unit | 3 | 1 | 3 | 0.07 | 95% | 95% | 95% | 0.11 |
| Area 2 | No. 2 Distillate Unifiner Unit | 1 | 5 | 1 | 0.07 | 95% | 95% | 95% | 0.11 |
| Area 2 | No. 1 Gas Recovery Unit | 1 | 7 | - | 0.07 | 95% | 95% | 95% | 0.12 |
| Area 2 | No. 4 DD Unit | 1 | 10 | - | 0.07 | 95% | 95% | 95% | 0.17 |
| Area 2 | No. 2 Naptha Fractionator Unit | 2 | 2 | - | 0.07 | 95% | 95% | 95% | 0.06 |
| Area 2 | No. 2 Visbreaker Unit | 2 | 2 | 2 | 0.07 | 95% | 95% | 95% | 0.09 |
| Area 2 | No. 2 Vacuum Unit | 1 | 7 | 2 | 0.07 | 95% | 95% | 95% | 0.15 |

**Limetree Bay Terminals and Refining**
**B-17 Oily Water Collection System Annual Potential to Emit**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Area 3 | 5 CDU | 2 | 5 | 7 | 0.07 | 95% | 95% | 95% | 0.21 |
| Area 3 | 6 CDU | 2 | 13 | 6 | 0.07 | 95% | 95% | 95% | 0.32 |
| Area 3 | No. 2 & 3 LPG Treatment Unit | - | 2 | 2 | 0.07 | 95% | 95% | 95% | 0.06 |
| Area 3 | No. 2 Gas Recovery | 3 | - | - | 0.07 | 95% | 95% | 95% | 0.05 |
| Area 3 | No.  4 Amine | 2 | - | - | 0.07 | 95% | 95% | 95% | 0.03 |
| Area 3 | No.  5 Amine | - | 4 | - | 0.07 | 95% | 95% | 95% | 0.06 |
| Area 3 | No. 2 Sulfolane Unit | 8 | 4 | - | 0.07 | 95% | 95% | 95% | 0.18 |
| Area 4 | No. 3 Platforming Unit | 7 | 9 | - | 0.07 | 95% | 95% | 95% | 0.25 |
| Area 4 | No. 3 Vacuum Unit | 8 | 2 | 2 | 0.07 | 95% | 95% | 95% | 0.18 |
| Area 4 | 6 DD | 4 | 3 | 3 | 0.07 | 95% | 95% | 95% | 0.15 |
| Area 4 | 7 DD | 5 | 2 | - | 0.07 | 95% | 95% | 95% | 0.11 |
| Area 4 | No. 4 Platforming Unit | 5 | 9 | 3 | 0.07 | 95% | 95% | 95% | 0.26 |
| Area 4 | 9 DD | 5 | 5 | - | 0.07 | 95% | 95% | 95% | 0.15 |
| Area 4 | LSG | - | 8 | - | 0.07 | 95% | 95% | 95% | 0.12 |
| Area 5 | No. 3 Platforming Unit | 7 | 9 | - | 0.07 | 95% | 95% | 95% | 0.25 |
| Area 5 | No. 3 Vacuum Unit | 8 | 2 | 2 | 0.07 | 95% | 95% | 95% | 0.18 |
| Area 5 | 6 DD | 4 | 3 | 3 | 0.07 | 95% | 95% | 95% | 0.15 |
| Area 5 | 7 DD | 5 | 2 | - | 0.07 | 95% | 95% | 95% | 0.11 |
| Area 5 | No. 4 Platforming Unit | 5 | 9 | 3 | 0.07 | 95% | 95% | 95% | 0.26 |
| Area 5 | 9 DD | 5 | 5 | - | 0.07 | 95% | 95% | 95% | 0.15 |
| Area 5 | LSG Unit | - | 8 | - | 0.07 | 95% | 95% | 95% | 0.12 |
| Area 5 | Amine | - | 5 | - | 0.07 | 95% | 95% | 95% | 0.08 |
| Area 5 | MTBE | - | 4 | - | 0.07 | 95% | 95% | 95% | 0.06 |
| Area 5 | TAME | - | 2 | - | 0.07 | 95% | 95% | 95% | 0.03 |
| Area 5 | Dimersol | - | 8 | - | 0.07 | 95% | 95% | 95% | 0.12 |
| Area 5 | FCC | - | 13 | - | 0.07 | 95% | 95% | 95% | 0.20 |
| Area 5 | Merox | - | 9 | - | 0.07 | 95% | 95% | 95% | 0.14 |
| Area 5 | Gas Con | - | 2 | - | 0.07 | 95% | 95% | 95% | 0.03 |
| Area 5 | Select Hydro | - | 3 | - | 0.07 | 95% | 95% | 95% | 0.05 |
| Area 6 | No. 3 & No. 4 Sour Water | 1 | 1 | 1 | 0.07 | 95% | 95% | 95% | 0.05 |
| Area 6 | No. 3 & No. 4 Sulfur Plant | 2 | 1 | 1 | 0.07 | 95% | 95% | 95% | 0.06 |
| Area 6 | No. 2 Beavon | 1 | 1 | - | 0.07 | 95% | 95% | 95% | 0.03 |
| Area 6 | No. 5 Sour Water | 2 | - | - | 0.07 | 95% | 95% | 95% | 0.03 |
| Area 6 | No. 5, 6, & 7 Flare Area | 1 | 1 | 1 | 0.07 | 95% | 95% | 95% | 0.05 |
| Area 6 | No. 3 Lagoon | 7 | 2 | 3 | 0.07 | 95% | 95% | 95% | 0.18 |
| Area 6 | No. 1 & 2 Sulfur Storage Area | - | - | 9 | 0.07 | 95% | 95% | 95% | 0.14 |
| Area 6 | No. 1 API | - | - | 6 | 0.07 | 95% | 95% | 95% | 0.09 |
| Area 6 | No. 1 Lagoon | 2 | - | - | 0.07 | 95% | 95% | 95% | 0.03 |
| Area 6 | No. 2 Lagoon | 4 | - | 3 | 0.07 | 95% | 95% | 95% | 0.11 |
| Utility II & No. 1 Powerhouse | No. 1 Powerhouse Area | - | 1 | 1 | 0.07 | 95% | 95% | 95% | 0.03 |
| Utility III & No. 2 Powerhouse | DESAL AREA | 3 | - | 2 | 0.07 | 95% | 95% | 95% | 0.08 |
| Utility III & No. 2 Powerhouse | No.  2 Powerhouse | 1 | - | 3 | 0.07 | 95% | 95% | 95% | 0.06 |
| Utility III & No. 2 Powerhouse | Gas Turbine 13 | 3 | - | - | 0.07 | 95% | 95% | 95% | 0.05 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TERMINAL | Tank Field No. 1 | - | - | 3 | 0.07 | 95% | 95% | 95% | 0.05 |
| TERMINAL | Tank Field No. 2 | - | - | 2 | 0.07 | 95% | 95% | 95% | 0.03 |
| TERMINAL | Tank Field No. 3 | - | - | 2 | 0.07 | 95% | 95% | 95% | 0.03 |
| TERMINAL | Tank Field No. 4 | - | - | 2 | 0.07 | 95% | 95% | 95% | 0.03 |
| TERMINAL | Tank Field No. 6 | 1 | - | 4 | 0.07 | 95% | 95% | 95% | 0.08 |
| TERMINAL | Tank Field No. 7 | - | - | 4 | 0.07 | 95% | 95% | 95% | 0.06 |
| TERMINAL | Tank Field No. 8 | - | - | 3 | 0.07 | 95% | 95% | 95% | 0.05 |
| TERMINAL | Tank Field No. 9 | - | - | 3 | 0.07 | 95% | 95% | 95% | 0.05 |
| TERMINAL | Tank Field No. 11 | - | - | 2 | 0.07 | 95% | 95% | 95% | 0.03 |
| TERMINAL | Tank Field No. 12 | - | - | 2 | 0.07 | 95% | 95% | 95% | 0.03 |
| TERMINAL | Tank Field No. 13 | 2 | - | 1 | 0.07 | 95% | 95% | 95% | 0.05 |
| TERMINAL | Tank Field No. 14 | 1 | - | 1 | 0.07 | 95% | 95% | 95% | 0.03 |
| TERMINAL | Tank Field No. 15 | - | - | 2 | 0.07 | 95% | 95% | 95% | 0.03 |
| TERMINAL | Tank Field No.16 | - | - | 2 | 0.07 | 95% | 95% | 95% | 0.03 |
| TERMINAL | Tank Field No. 17 | 2 | - | - | 0.07 | 95% | 95% | 95% | 0.03 |
| TERMINAL | Tank Field No. 18 | - | 1 | 1 | 0.07 | 95% | 95% | 95% | 0.03 |
| TERMINAL | Tank Field No. 19 | - | - | 1 | 0.07 | 95% | 95% | 95% | 0.02 |
| TERMINAL | Tank Field No. 20 | 1 | - | - | 0.07 | 95% | 95% | 95% | 0.02 |
| TERMINAL | Tank Field No. 21 | 1 | - | - | 0.07 | 95% | 95% | 95% | 0.02 |
| TERMINAL | Tank Field No. 22 | 1 | 1 | - | 0.07 | 95% | 95% | 95% | 0.03 |
| TERMINAL | Tank Field No. 56 | - | - | 9 | 0.07 | 95% | 95% | 95% | 0.14 |
| TERMINAL | Tank Field No. 57 | - | - | 2 | 0.07 | 95% | 95% | 95% | 0.03 |
| TERMINAL | Tank Field No. 59 | 4 | - | 1 | 0.07 | 95% | 95% | 95% | 0.08 |
| TERMINAL | Tank Field No. 60 | 6 | - | 1 | 0.07 | 95% | 95% | 95% | 0.11 |
| TERMINAL | No. 1 Pump Manifold | 1 | 2 | 3 | 0.07 | 95% | 95% | 95% | 0.09 |
| TERMINAL | BTX Pump Manifold | - | - | 4 | 0.07 | 95% | 95% | 95% | 0.06 |
| TERMINAL | BTX Cargo | - | 1 | - | 0.07 | 95% | 95% | 95% | 0.02 |
| TERMINAL | Metering Manifold | - | 1 | - | 0.07 | 95% | 95% | 95% | 0.02 |
| TERMINAL | No. 2 Pump Manifold | - | - | 1 | 0.07 | 95% | 95% | 95% | 0.02 |
| TERMINAL | No. 3 Pump Manifold | 1 | - | - | 0.07 | 95% | 95% | 95% | 0.02 |
| TERMINAL | Propane Truck | - | - | 4 | 0.07 | 95% | 95% | 95% | 0.06 |

**Limetree Bay Terminals and Refining**
**B-18 Wastewater Treatment Plant Annual Potential to Emit**

**Description**: wastewater from the base refinery is treated at three API/WEMCO trains. Oil recovered in the API/WEMCO's is returned to for processing. Wastewater from #1 and #2 trains are routed to the West Benzene Stripper and wastewater from #3 train is routed to the East Benzene Stripper. Volatiles are captured by an activated carbon bed that is regenerated onsite. Wastewater is further treated at the advanced wastewater treatment plant (AWWTP) that also receives and treats wastewaters from the FCC Complex. The AWWTP consists of aeration/degas, clarifier and bioslurry tanks.

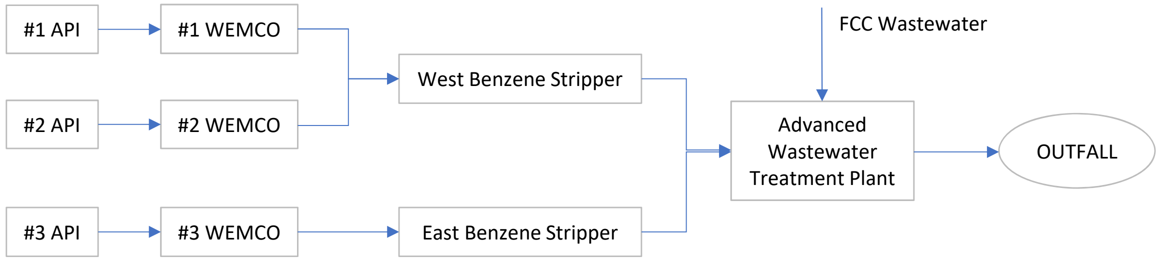


**Table 1 - Wastewater Treatment Plant Potential to Emit**

| Unit | Max. Design Rate (gpm)(1) | Emission Factor (lb/10^3 gal)(2) | Controls Description | Annual Emission (tpy)(5) |
|---|---|---|---|---|
| #1 API (Unit No. 1660) | 3,325 | 0.2 | Floating roof w/seals | 175 |
| #1 WEMCO | 2,660 | 0.2 | Carbon adsorption system | 140 |
| #2 API (Unit No. 1661) | 2,698 | 0.2 | Floating roof w/seals | 142 |
| #2 WEMCO | 2,660 | 0.2 | Carbon adsorption system | 140 |
| West Benzene Stripper (3) | 1,600 | | Activated Carbon Bed | 7 |
| #3 API (Unit No. 1662) | 3,712 | 0.2 | Floating roof w/seals | 195 |
| #3 WEMCO | 3,660 | 0.2 | Carbon adsorption system | 192 |
| East Benzene Stripper (3) | 3,200 | | Activated Carbon Bed | 13 |
| AWWTP(4) | 2,120 MMgal/yr | | | 3.5 |
| | | | **TOTAL VOC** | **1,007** |

Notes:

(1) Maximum design rate

(2) Emission factor for API and WEMCO units per AP-42, Chapter 5.1, Table 5.1-3 Oil/Water controlled

(3) Benzene strippers based on 2001 Title V application submittal data

(4) AWWTP limit per Permit to Operate STX-N-Z-08, II.G.

(5) Annual Emissions (tpy) = Max. Design Rate (gallon/min) * Emission Factor (lb/10^3 gal) * 10^3 gal/1,000 gal * 60 min/hr * 8760 hr/yr * 1 ton/2,000 lb

Example: #1 API VOC Emissions = 3,325 gal/min * 0lb/10^3 gal * 10^3 gal/1,000 gal * 60 min/hr * 8760 hr/yr * 1 ton/2,000 lb = 175 tpy

## Limetree Bay Terminals and Refining
## B-19 Local Sales Rack and Service Station Annual Potential to Emit

**Description**: the facility local sales rack serves the St. Croix local market with unleaded gasolines (regular and premium), Jet A, No. 2 Oil and Propane as well as the intraplant fuel consumption with unleaded regular gasoline and No. 2 oil. Tank trucks are loaded at the Local Sales Rack via submerged loading. Gasoline loading emissions are further controlled with a Vapor Recovery Unit (VRU). Intraplant tank trucks are loaded at the Sales Rack to serve gasoline/No. 2 oil firing equipment around the facility.

The fueling for stationary sources fired with gasoline and No. 2 oil is conducted by a tank truck that is filled at the facility service station. The service station also fuels the facility car and truck fleet. The service station is equipped with two underground storage tanks that are submerged filled (USTs D-1625 gasoline and D-1626 No. 2 oil).

**Table 1 - Local Sales Rack Potential to Emit**

| Products | Sales (bbls/yr)(1) | Intraplant Consumption (bbls/yr)(1) | Effective No. of Loadings (load/yr)(1) | S Factor(2) | TVP(3) (psia) | M (lb/lbmole)(4) | T (°F)(5) | T (°R) | Loading Losses (lb/10^3 gal)(6) | Loading Losses (lb/load)(7) | Annual VOC Emissions (tpy)(8) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Unleaded Regular Gasoline | 647,739 | 23,960 | | | | | | | 0.3 | | 4.1 |
| Unleaded Premium Gasoline | 128,349 | - | | | | | | | 0.3 | | 0.8 |
| Jet A | 121,841 | - | | 0.5 | 0.0156 | 130.0 | 87.3 | 547.0 | 0.02 | | 0.06 |
| No. 2 Oil | 216,507 | 64,325 | | 0.5 | 0.0128 | 130.0 | 87.3 | 547.0 | 0.02 | | 0.14 |
| Propane | 114,669 | 1,047 | 750 | | | | | | | 3.29 | 1.2 |
| | | | | | | | | | | **TOTAL** | **6.3** |

Notes:

(1) Sales, intraplant fuel consumption and effective number of propane loadings for 550 mbpd refinery

(2) Saturation factor for submerged loading of a clean tank truck, per AP-42, Chapter 5.2, Table 5.2-5

(3) True Vapor Pressure calculated by the Environmental Department

(4) Molecular Weight per AP-42, Chapter 7.1

(5) Average daily maximum temperature in St. Croix as measured by Cottage Meteorological Station 2009-2010

T (°R) = T (°F) + 459.67

(6) Loading Losses (lb/10^3 gal):

- Gasoline loading losses VOC ≤ 35 mg/L per STX-TV-003-10, §3.1.6.1.2
- Jet A and No. 2 Oil Loading Losses (lb/10^3 gal) = 12.46 * SPM/T per AP-42, Chapter 5.2, Equation 1.

Example: Jet A Uncontrolled Loading Losses = 12.46 * 0.5 * 0.0156 * 130 / 547 = 0.02 lb/10^3 gal

(7) Propane loading losses = 3.29 lb/load (site data, volume propane remaining in the loading lines after loading has been completed)

(8) Annual VOC Emissions (tpy) = Rack Total (bbls/yr) * Loading Losses (lb/10^3 gal) * 10^3 gal/1,000 gal * 42 gal/bbl * 1 ton/2,000 lb

Example: Unleaded Regular Gasoline VOC Emissions = 671,699 bbl/yr * 0.3 lb/10^3 gal * 10^3 gal/1,000 gal * 42 gal/bl * 1 ton/2,000 lb = 4.1 tpy

Annual VOC Emissions (tpy) = Effective No. Loadings (load/yr) * Loading Losses (lb/load) * 1 ton/2,000 lb

Example: Propane VOC Emissions = 750 load/yr * 3.3 lb/load * 1 ton/2,000 lb = 1.2 tpy

## Limetree Bay Terminals and Refining
## B-19 Local Sales Rack and Service Station Annual Potential to Emit

**Table 2 - Service Station Fueling Potential to Emit**

| Activity | Intraplant Consumption | | Loading Losses | | Annual VOC Emissions (tpy)(3) |
|---|---|---|---|---|---|
| | Unleaded Regular Gasoline | No. 2 Oil | Unleaded Regular Gasoline | No. 2 Oil | |
| Submerged filling USTs | 23,960 | 64,325 | 7.3 | | 13.5 |
| UST breathing and emptying | | | 1.0 | | 1.9 |
| Vehicle refueling displacement losses (uncontrolled) | | | 11.0 | 1.5 | 7.6 |
| Spillage | | | 0.7 | | 1.3 |
| **TOTAL** | | | | | **24.3** |

Notes:

(1) Intraplant fuel consumption for 550 mbpd refinery

(2) Loading Losses per AP-42, Chapter 5.2, Table 5.2-7 defaults except for No. 2 Oil vehicle refueling, which is calculated using Equation 6:

$E_R$ (mg/L) = 264.2 * (-5.909 - 0.0949 * ΔT + 0.0884 * $T_D$ + 0.485 * RVP)

$E_R$ (lb/10^3 gal) = $E_R$ (mg/L) * 1 lb/453.59 g * 3.7854 L/gal

| | | | |
|---|---|---|---|
| Difference bewtween temperature of the fuel in vehicle tank and temperature of dispensed fuel, ΔT = | 12.0 | °F | |
| Temperature of dispensed fuel, $T_D$ = | 87.3 | °F | average ambient temperature |
| Reid Vapor Pressure, RVP = | 0.023 | psia | No. 2 oil default |

(3) Annual VOC Emissions = Intraplant Consumption (bbl/yr) * Loading Losses (lb/10^3 gal) * 10^3 gal/1,000 gal * 42 gal/bbl * 1 ton/2,000 lb

Example: Submerged Filling USTs VOC Emissions = (23,960 + 64,325) * 7.3 * 10^3 gal/1,000 gal * 42 gal/bbl * 1 ton/2,000 lb = 13.5 tpy

Example: Vehicle Refueling Displacement Losses VOC Emissions = (23,960 * 11.0 + 64,325 * 1.5) * 10^3 gal/1,000 gal * 42 gal/bbl * 1 ton/2,000 lb = 7.6 tpy

**Limetree Bay Terminals and Refining**
**B-20 Marine Loading Annual Potential to Emit**

**Description**: the facility is designed to load, unload and conduct ship to ship transfers of multiple petroleum products at the Docks, this flexibility is key to ensure proper operation of the facility. All ship loading is submerged filling.
The Docks include 11 docks and an SPM.

**Table 1 - Marine Loading Annual Emissions**

| Product Loaded | Loading Rate (bbls/yr)(1) | | Saturation Factor(2) | | Liquid True Vapor Pressure (psia)(3) | Vapors Molecular Weight (lb/lbmole)(3) | Temperature of Bulk Liquid (°R)(3) | Loading Losses (lb/10^3 gal)(4) | | Uncontrolled VOC Potential to Emit (tpy)(5) | | Control Efficiency (%)(6) | Annual Potential to Emit (tpy)(7),(8) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Barges | Ships | Barges | Ships | | | | Barges | Ships | Barges | Ships | | VOC | H2S |
| Crude Oils | - | 127,100,000 | | | 5.8 | 68.2 | 540.0 | 0.8 | 0.8 | - | 1,898 | - | 1,898 | 2.4 |
| Gasoline/Gasoline Blendstocks | 150,000 | 9,850,000 | | | | | | 3.4 | 1.8 | 10.7 | 372 | - | 383 | - |
| Gasoline/Gasoline Blendstocks | - | 69,000,000 | | | | | | 3.4 | 1.8 | - | 2,608 | - | 2,608 | - |
| Platformate | - | 219,687 | 0.5 | 0.2 | 2.2 | 105.0 | 540.0 | 2.6 | 1.1 | - | 4.9 | - | 4.9 | - |
| MTBE | - | 121,213 | 0.5 | 0.2 | 7.4 | 85.0 | 540.0 | 7.2 | 2.9 | - | 7.4 | - | 7.4 | - |
| Methanol | - | 46,549 | 0.5 | 0.2 | 2.7 | 32.0 | 540.0 | 1.0 | 0.4 | - | 0.4 | - | 0.4 | - |
| Toluene | - | 2,215,177 | 0.5 | 0.2 | 0.6 | 92.0 | 540.0 | 0.6 | 0.3 | - | 11.9 | - | 12 | - |
| Xylene | - | 2,026,556 | 0.5 | 0.2 | 0.2 | 106.0 | 540.0 | 0.2 | 0.1 | - | 4.2 | - | 4 | - |
| Jet A + DERD | - | 25,642,771 | | | | | | 0.013 | 0.005 | - | 2.7 | - | 2.7 | - |
| Kerosene | - | 967,292 | | | | | | 0.013 | 0.005 | - | 0.1 | - | 0.1 | - |
| No. 2 Oils | 2,081,877 | 55,318,762 | | | | | | 0.012 | 0.005 | 0.5 | 5.8 | - | 6.3 | - |
| Light Cycle Oil | - | 1,027,604 | 0.5 | 0.2 | 0.03 | 130.0 | 540.0 | 0.04 | 0.02 | - | 0.39 | - | 0.39 | - |
| CATFEED | - | 6,506,467 | 0.5 | 0.2 | 0.0001 | 190.0 | 540.0 | 0.0002 | 0.0001 | - | 0.01 | - | 0.01 | 0.003 |
| SVGO (VGO, HAGO) | - | 20,687,215 | 0.5 | 0.2 | 0.0001 | 190.0 | 540.0 | 0.0002 | 0.0001 | - | 0.03 | - | 0.03 | 0.01 |
| Slurry | - | 865,127 | 0.5 | 0.2 | 0.0001 | 190.0 | 540.0 | 0.0002 | 0.0001 | - | 0.001 | - | 0.001 | 0.0004 |
| No. 6 Oils | 1,251,411 | 18,795,208 | | | | | | 0.00009 | 0.00004 | 0.002 | 0.02 | - | 0.02 | 0.03 |
| **TOTAL** | **3,483,288** | **340,389,628** | | | | | | | | **11** | **4,916** | | **2,000** | **2.4** |

Notes:
(1) Loading rates established based on 550,000 bpd refinery, except for crude oil and gasoline/gasoline blendstocks which are based on STX-895-AC-PO-18-2 permit limits for these products
(2) Saturation factor, S, per AP-42, Chapter 5.2, Table 5.2-1
(3) Liquid true vapor pressure and vapor molecular weight:
- For crude oils conservative assumption of crude mixture (Boscan - US Light Blend) results in higher vapor pressure at bulk liquid temperature
- For refined products based on physical-chemical databases
- For CATFEED, SVGO and Slurry per Annex G "Properties of Heavy Fuel Oil", API MPMS Chapter 19.4: TVP (psia) = exp(10.104 - 10,475.5 /T (°R))

Loading temperature assumed to be 80°F

(4) Loading losses (lb/10^3 gal):
- For crude oils per AP-42, Chapter 5.2, Equations 2 and 3

CL = CA + CG

CA = arrival emission factor = 0.3 lb/10^3 per AP-42, Chapter 5.2, Table 2.2-3 for cleaned or gas-freed volatile cargos

CG (lb/1,000 gal) = 1.84* (0.44*P - 0.42) * MG/T

G = vapor growth factor = 1.02

Example: Crude Oils CG = 1.84 * (0.44 * 5.8 psia - 0.42) * 68.2 lb/lbmole * 1.02 / 540.0 R = 0.5 lb/10^3 gal

Example Crude Oils Loading Losses = 0.33 lb/10^3 gal + 0.5 lb/10^3 gal = 0.8 lb/10^3 gal

- For gasoline/gasoline blendstocks loading losses per AP-42, Chapter 5.2, Table 5.2-2 for typical overall situation
- For Jet A + DERD, Kerosene, No. 2 Oils and No. 6 Oils per AP-42, Chapter 5.2, Table 5.2-6
- For other refined products per AP-42, Chapter 5.2, Equation 1

LL = 12.46 * SPM/T

Example: Platformate Loading Losses for Barges = 12.46 * 0.5 * 2.2 psia * 105.0 lb/lbmole / 540.0 R = 2.6 lb/10^3 gal

# Limetree Bay Terminals and Refining
## B-20 Marine Loading Annual Potential to Emit

(5) Uncontrolled Potential to Emit (tpy) = Loading Rate (bbls/yr) * 42 gal/bbl * 10^3 gal/1000 gal * Loading Losses (lb/10^3gal) * 1 ton/2,000 lb

For crude oils, calculated loading losses are losses of total organic compounds. VOC = 85 % of TOC per AP-42, Chapter 5.2.

Example: Uncontrolled Crude Oil VOC PTE from Ships = 127,100,000 bbls/yr * 42 gal/bbl * 10^3 gal/1,000 gal * 0.8 lb/10^3 gal * 85/100 = 1,898 tpy

(6) [RESERVED]

(7) Per STX-895-AC-PO-18-2, Section III.B.1.(a).ii, total VOC emissions from the Docks shall not exceed 2,000 tpy on a rolling 12-month period until the MVCS is in place

(8) H2S potential emissions calculated based on “Using K Factors to Estimate Quantities of Individual Vapor Species Emitted During the Storage and Transfer of Hydrocarbon Liquids” by Jeffrey Meling, Karen Horne, and Jay Hoover

$H_2S$ (tpy) = VOC (tpy) * MR

MR = $y_{H2S}$ * 1/$P_{VOC}$ * ($M_{H2S}$ / $M_{VOC}$)

MR = $ppmv_{H2S}$/1,000,000 * (14.7 / TVP) * ($M_{H2S}$ / $M_{VOC}$)

| | | |
|---|---|---|
| H2S in Head Space from crude oils = | 1,000 | ppmv |
| H2S in Head Space for 6 oils and heavier = | 10 | ppmv |
| H2S Molecular Weight = | 34.1 | lb/lbmole |

No. 6 Oil, Annex G "Properties of Heavy Fuel Oil", API MPMS Chapter 19.4: TVP (psia) = exp (10.781 - 8,933/(T(F) + 459.7)) and MW = 130 lb/lbmole

## Limetree Bay Terminals and Refining
## B-20 Marine Loading MVCS Annual Potential to Emit

**Table 1 - Thermal Oxidizer H-1612 Annual Emissions Calculation**

| Parameter | Value | Units | Reference |
|---|---|---|---|
| Loading Loss (L) | 2.60 | lb/10^3gal | AP-42, Chapter 5.2, Table 5.2-2 Uncleaned ships |
| Annual Average Throughput | 69,000,000 | bbl/yr | |
| Daily Average Throughput | 189,041 | bbl/day | Total Marine Loading Throughput (bbl/yr) * 1 yr/ 365 days |
| | 7,940 | 10^3gal/day | gal/day = bbl/day * 42 gal/bbl * 10^3gal/1,000 gal |
| Uncontrolled VOC Vapors | 20,643 | lb/day | Uncontrolled VOC (lb/day) = L (lb/10^3 gal) * Throughput (10^3gal/day) |
| Assuming hydrocarbon portion of vapors are 60% C4 36% C5 4% C6 | | | |
| C4 volume percent | 60% | | John Zink |
| C4 heating value | 3,010 | Btu/scf | John Zink |
| C4 molecular weight | 58.14 | lb/lbmole | John Zink |
| | 385.3 | scf/lbmole | 40 CFR §60.2 Standard conditions means a temperature of 293 K (68F) and a pressure of 101.3 kilopascals (29.92 in Hg). |
| Enthalpy (C4 contribution) | 11,969 | Btu/lb | Btu/lb = Btu/scf * vol% C4 * scf/lbmole * 1/MW (lb/lbmole), where vol%C4 = 60% |
| C5 volume percent | 36% | | John Zink |
| C5 heating value | 3,700 | Btu/scf | John Zink |
| C5 molecular weight | 72.17 | lb/lbmole | John Zink |
| | 385.3 | scf/lbmole | 40 CFR §60.2 Standard conditions means a temperature of 293 K (68F) and a pressure of 101.3 kilopascals (29.92 in Hg). |
| Enthalpy (C5 contribution) | 7,111 | Btu/lb | Btu/lb = Btu/scf * vol% C5 * scf/lbmole * 1/MW (lb/lbmole), where vol%C5 = 36% |
| C6 volume percent | 4% | | John Zink |
| C6 heating value | 4,315 | Btu/scf | John Zink |
| C6 molecular weight | 86.17 | lb/lbmole | John Zink |
| | 385.3 | scf/lbmole | 40 CFR §60.2 Standard conditions means a temperature of 293 K (68F) and a pressure of 101.3 kilopascals (29.92 in Hg). |
| Enthalpy (C6 contribution) | 772 | Btu/lb | Btu/lb = Btu/scf * vol% C6 * scf/lbmole * 1/MW (lb/lbmole), where vol%C6 = 4% |
| Total Hydrocarbon Enthalpy | 19,852 | Btu/lb | Hydrocarbon Enthalpy = Enthalpy (C4) + Enthalpy (C5) + Enthalpy (C6) |
| Hydrocarbon Heat Release | 409.81 | MMBtu/day | Hydrocarbon Heat Release (MMBtu/day) = Hydrocarbon Enthalpy (Btu/lb) * Uncontrolled VOC (lb/day) * 1MMBtu/10^6 Btu |
| Pilot & Assist Heat Release | 138.63 | MMBtu/day | John Zink Estimated Representation |
| Total Heat Release Per Day | 548.43 | MMBtu/day | Total Heat Release (MMBtu/day) = Hydrocarbon Heat Release (MMBtu/day) + Pilot & Assit Heat Release (MMBtu/day) |
| Destruction Removal Efficiency | 99.9% | DRE | John Zink Guarantee |
| Emissions Rate (VOC) | 27.38 | lb/day | With ASsist Gas + Pilot Gas |
| Emissions Per Year (VOC) | 9,994 | lb/yr | lbs/yr = lb/day * 365 days/yr |
| **Emissions Per Year (VOC)** | **5.0** | **tpy** | tpy = lbs/yr * 1 ton/2,000 lb |
| Emissions Factor (CO) | 0.02 | lbs/MMBtu | John Zink NOxStarTM Guarantee |
| Emissions Rate (CO) | 10.97 | lbs/day | lb/day = Total Heat Release (MMBtu/day) * Emission Factor (lb/MMBtu) |
| Emissions Per Year (CO) | 4,004 | lbs/yr | lbs/yr = lb/day * 365 days/yr |
| **Emissions Per Year (CO)** | **2.0** | **tons/yr** | tpy = lbs/yr * 1 ton/2,000 lb |
| Emissions Rate (NOx) | 0.015 | lbs/MMBtu | John Zink NOxStarTM Guarantee |
| Emissions Rate (NOx) | 8.23 | lbs/day | lb/day = Total Heat Release (MMBtu/day) * Emission Factor (lb/MMBtu) |
| Emissions Per Year (NOx) | 3,003 | lbs/yr | lbs/yr = lb/day * 365 days/yr |
| **Emissions Per Year (NOx)** | **1.5** | **tons/yr** | tpy = lbs/yr * 1 ton/2,000 lb |

**Limetree Bay Terminals and Refining**
**B-20 Marine Loading MVCS Annual Potential to Emit**

**Table 1 - Thermal Oxidizer H-1612 Annual Emissions Calculation**

| Parameter | Value | Units | Reference |
|---|---|---|---|
| Pilot & Assist Sulfur Content | 0.54 | gr/100scf | Propane |
| Pilot & Assit Heating Content | 91.50 | MMBtu/10^3gal | Propane |
| Pilot & Assit Emission Factor (SO2) | 0.05 | lb/10^3 gal | AP-42 Chapter 1.5 Table 1.5-1: SO2 Emission Factor = 0.1 * S (grains/100scf) |
| Pilot & Assit Emissions Rate (SO2) | 0.001 | lb/MMBtu | lb/MMBtu = Emission Factor (lb/10^3gal) / Heating Content (MMBtu/10^3gal) |
| | | | |
| Sulfur Content Hydrocarbon Vapors | 10.00 | ppmw | Operations data |
| Sulfur Content Hydrocarbon Vapors | 0.001% | | |
| | | | |
| Emissions per Day (SO2) | 0.29 | lb/day | SO2 (lb/day) = Uncontrolled Hydrocarbons (lb/day) * DRE (%) * Sulfur Content (%) + SO2 Pilot (lb/MMBtu) * MMBtu/day Pilot |
| Emissions Per Year (SO2) | 105.13 | lbs/yr | lbs/yr = lb/day * 365 days/yr |
| **Emissions Per Year (SO2)** | **0.05** | **tons/yr** | tpy = lbs/yr * 1 ton/2,000 lb |
| **Emission Per Year (H2SO4)** | **0.01** | **tons/yr** | H2SO4 (tpy) = SO2 (tpy) * 10% SO3/SO2 * 100% H2SO4/SO3 * MWH2SO4/MWSO2 |
| | | | |
| Pilot & Assist Emission Factor (PM, PM10, PM2.5) | 0.70 | lb/10^3 gal | AP-42 Chapter 1.5 Table 1.5-1. According to AP 42 Chapter 13.5 "Industrial Flares" soot for nonsmoling flares = 0 ug/L |
| Pilot & Assist Emissions Rate (PM, PM10, PM2.5) | 0.01 | lb/MMBtu | lb/MMBtu = Emission Factor (lb/10^3gal) / Heating Content (MMBtu/10^3gal) |
| Emissions per Day (PM, PM10, PM2.5) | 1.06 | lb/day | lb/day = Total Heat Release (MMBtu/day) * Emission Factor (lb/MMBtu) |
| Emissions Per Year (PM, PM10, PM2.5) | 387.09 | lbs/yr | lbs/yr = lb/day * 365 days/yr |
| **Emissions Per Year (PM, PM10, PM2.5)** | **0.2** | **tons/yr** | tpy = lbs/yr * 1 ton/2,000 lb |
| | | | |
| Pilot & Assist Emission Factor (CO2) | 12,500 | lb/10^3 gal | AP-42 Chapter 1.5 Table 1.5-1 |
| Pilot & Assit Emissions Rate (CO2) | 136.61 | lb/MMBtu | lb/MMBtu = Emission Factor (lb/10^3gal) / Heating Content (MMBtu/10^3gal) |
| Emission per Day (CO2) | 18,938 | lb/day | lb/day = Total Heat Release (MMBtu/day) * Emission Factor (lb/MMBtu) |
| Emissions Per Year (CO2) | 6,912,397 | lbs/yr | lbs/yr = lb/day * 365 days/yr |
| **Emissions Per Year (CO2)** | **3,456** | **tons/yr** | tpy = lbs/yr * 1 ton/2,000 lb |

**Limetree Bay Terminals**
**B-21 Sulfur Handling and Storage Annual Potential to Emit**

**Description**: the East and the West Sulfur Recovery Plants (SRP) pelletizers drop the elemental sulfur pellets into each plant stockpile. From these satellite storage areas, the elemental sulfur is trucked to the Docks Sulfur Storage Sulfur. The sulfur is retrieved from the Docks stockpile and loaded into the ship loading conveyor. The conveyor is equipped with rain caps. All three storage areas have partial enclosure to reduce wind erosion of the stockpiles.

**Table 1 - Sulfur Handling & Storage Fugitive Particulate Emissions**

| Activity | Annual Potential to Emit (tpy)(1) | | |
|---|---|---|---|
| | PM | PM10 | PM2.5 |
| East SRUs Sulfur Handling | 1.7 | 1.0 | 0.4 |
| West SRUs Sulfur Handling | 1.5 | 0.8 | 0.3 |
| Sulfur Storage Handling & Shipping | 5.8 | 3.1 | 1.0 |
| **TOTAL** | **8.9** | **4.8** | **1.7** |

Notes:
(1) Refer to tables 2-4 for detailed calculations

**Table 2 - East SRUs Sulfur Handling Fugitive Emissions**

| Activity | Sulfur Handling Rate (tpy)(1) | Uncontrolled Emission Factor (lb/ton)(2) | | | Stockpile Area (acres)(3) | Wind Erosion Emission Factor (lb/acre-day)(4) | Controls Description(4) | Control Efficiency (%)(5) | Annual Potential to Emit (tpy)(6),(7) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | PM | PM10 | PM2.5 | | | | | PM | PM10 | PM2.5 |
| East SRUs Drop from Conveyor to Stockpile | 100,375 | 0.013 | 0.006 | 0.001 | | | None | - | 0.66 | 0.31 | 0.05 |
| Load from Stockpile into Truck | 100,375 | 0.013 | 0.006 | 0.001 | | | None | - | 0.66 | 0.31 | 0.05 |
| East SRUs Stockpile Wind Erosion | | | | | 1.1 | 3.5 | Partial enclosure (3 walls 6.5 ft) | 50 | 0.35 | 0.35 | 0.35 |
| | | | | | | | | **TOTAL** | **1.7** | **1.0** | **0.4** |

Notes:
(1) Sales maximum design throughput for the SRUs (East and West) = 550 tpd
Example: East Sulfur Handling Rate = 550 ton/day * 365 day/yr / 2 = 100,375 tpy
(2) Uncontrolled emission factor per AP-42, Chapter 13.2.4, Equation 1 (valid for moisture content range of 0.25 - 4.8 %, silt content range of 0.44 - 19%)
E (lb/ton) = k * 0.0032 * (U/5)^1.3 / (M/2)^1.4
AP-42, Chapter 13.2.4-4, particle size multiplier (k):
k (PM) = 0.74 (AP-42, 13.2.4-4, Aerodynamic Particle Size Multiplier (k) for particle size < 30 μm)
k (PM10) = 0.35 (AP-42, 13.2.4-4, Aerodynamic Particle Size Multiplier (k) for particle size < 10 μm)
k (PM2.5) = 0.053 (AP-42, 13.2.4-4, Aerodynamic Particle Size Multiplier (k) for particle size < 2.5 μm)
U = 8.8 mph. Average wind speed based on 2009 and 2010 data from Cottage Meteorological Station
M = 1.0 % (from product specifications)
Example: PM Uncontrolled Emission Factor = 0.74 * 0.0032 * (8.8/5)^1.3 / (1.0/2)^1.4 = 0.013 lb/ton
(3) Site data
(4) Stockpile wind erosion emission factor per CHEER (Coal Handling Emissions Evaluation Roundtable) Workshop, TNRCC (May 16, 1995) and per EPA-450/3-74-037 Development of Emission Factors for Fugitive Dust Sources (EPA, June 1974)
(5) Control efficiency per CHEER (Coal Handling Emissions Evaluation Roundtable) Workshop, TNRCC (May 16, 1995):

| | Control Efficiency | |
|---|---|---|
| Established wind breaks | 50 | The stockpile is surrounded by 6.5ft walls around three sides |

(6) Annual Potential to Emit (Drop Points) = Sulfur Production Rate (ton/yr) * Uncontrolled Emission Factor (lb/ton) * (1 - Control Eff) * 1 ton/2,000 lb
Example: PM Emissions from East SRUs Drop from Conveyor to Stockpile = 100,375 ton/yr * 0.013 lb/ton * (1 - 0) * 1 ton/2,000 lb = 0.66 tpy
(7) Annual Potential to Emit (Stockpiles) = Stockpile Area (acres) * Wind Erosion Emission Factor (lb/acre-day) * 365 days/yr * (1 - Control Eff) * 1 ton/2,000 lb
Example: PM Emissions from East SRUs Stockpile Wind Erosion = 1.1 acres * 3.5 lb/acre-day * 365 days/yr * (1 - 0.5) * 1 ton/2,000 lb = 0.35 tpy

## Limetree Bay Terminals
## B-21 Sulfur Handling and Storage Annual Potential to Emit

### Table 3 - West SRUs Sulfur Handling Fugitive Emissions

| Activity | Sulfur Handling Rate (tpy)(1) | Uncontrolled Emission Factor (lb/ton)(2) | | | Stockpile Area (acres)(3) | Wind Erosion Emission Factor (lb/acre-day)(4) | Controls Description(4) | Control Efficiency (%)(5) | Annual Potential to Emit (tpy)(6),(7) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | PM | PM10 | PM2.5 | | | | | PM | PM10 | PM2.5 |
| West SRUs Drop from Conveyor to Stockpile | 100,375 | 0.013 | 0.006 | 0.001 | | | None | - | 0.66 | 0.31 | 0.05 |
| Load from Stockpile into Truck | 100,375 | 0.013 | 0.006 | 0.001 | | | None | - | 0.66 | 0.31 | 0.05 |
| West SRUs Stockpile Wind Erosion | | | | | 0.5 | 3.5 | Partial enclosure (3 walls 6.5 ft) | 50 | 0.16 | 0.16 | 0.16 |
| | | | | | | | | TOTAL | 1.5 | 0.8 | 0.3 |

Notes:

(1) Sales maximum design throughput for the SRUs (East and West) = 550 tpd

Example: West Sulfur Handling Rate = 550 ton/day * 365 day/yr / 2 = 100,375 tpy

(2) Uncontrolled emission factor per AP-42, Chapter 13.2.4, Equation 1 (valid for moisture content range of 0.25 - 4.8 %, silt content range of 0.44 - 19%)

E (lb/ton) = k * 0.0032 * (U/5)^1.3 / (M/2)^1.4

AP-42, Chapter 13.2.4-4, particle size multiplier (k):

| | | |
|---|---|---|
| k (PM) = | 0.74 | (AP-42, 13.2.4-4, Aerodynamic Particle Size Multiplier (k) for particle size < 30 μm) |
| k (PM10) = | 0.35 | (AP-42, 13.2.4-4, Aerodynamic Particle Size Multiplier (k) for particle size < 10 μm) |
| k (PM2.5) = | 0.053 | (AP-42, 13.2.4-4, Aerodynamic Particle Size Multiplier (k) for particle size < 2.5 μm) |
| U = | 8.8 | mph. Average wind speed based on 2009 and 2010 data from Cottage Meteorological Station |
| M = | 1.0 | % (from product specifications) |

Example: PM Uncontrolled Emission Factor = 0.74 * 0.0032 * (8.8/5)^1.3 / (1.0/2)^1.4 = 0.013 lb/ton

(3) Site data

(4) Stockpile wind erosion emission factor per CHEER (Coal Handling Emissions Evaluation Roundtable) Workshop, TNRCC (May 16, 1995) and per EPA-450/3-74-037 Development of Emission Factors for Fugitive Dust Sources (EPA, June 1974)

(5) Control efficiency per CHEER (Coal Handling Emissions Evaluation Roundtable) Workshop, TNRCC (May 16, 1995):

| | Control Efficiency | |
|---|---|---|
| Established wind breaks | 50 | The stockpile is surrounded by 6.5ft walls around three sides |

(6) Annual Potential to Emit (Drop Points) = Sulfur Production Rate (ton/yr) * Uncontrolled Emission Factor (lb/ton) * (1 - Control Eff) * 1 ton/2,000 lb

Example: PM Emissions from West SRUs Drop from Conveyor to Stockpile = 100,375 ton/yr * 0.013 lb/ton * (1 - 0) * 1 ton/2,000 lb = 0.66 tpy

(7) Annual Potential to Emit (Stockpiles) = Stockpile Area (acres) * Wind Erosion Emission Factor (lb/acre-day) * 365 days/yr * (1 - Control Eff) * 1 ton/2,000 lb

Example: PM Emissions from West SRUs Stockpile Wind Erosion = 0.5 acres * 3.5 lb/acre-day * 365 days/yr * (1 - 0.5) * 1 ton/2,000 lb = 0.16 tpy

## Limetree Bay Terminals
## B-21 Sulfur Handling and Storage Annual Potential to Emit

**Table 4 - Sulfur Storage Handling Fugitive Emissions**

| Activity | Sulfur Handling Rate (tpy)(1) | Conveyor Belt Length (ft)(2) | Stockpile Area (acres)(2) | Uncontrolled Emission Factor (lb/ton)(3),(4) | | | Wind Erosion Emission Factor (lb/acre-day)(5) | Controls Description(6) | Control Efficiency (%)(6) | Annual Potential to Emit (tpy)(7),(8) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | PM | PM10 | PM2.5 | | | | PM | PM10 | PM2.5 |
| Drop from Truck to Stockpile | 200,750 | | | 0.013 | 0.006 | 0.001 | | None | - | 1.3 | 0.6 | 0.1 |
| Load from Stockpile into Conveyor | 200,750 | | | 0.013 | 0.006 | 0.001 | | None | - | 1.3 | 0.6 | 0.1 |
| Conveyor Belt | 200,750 | 560 | | 0.024 | 0.012 | 0.002 | | Rain covers | 50 | 1.2 | 0.6 | 0.1 |
| Drop from Conveyor Belt into Ship | 200,750 | | | 0.013 | 0.006 | 0.001 | | None | - | 1.3 | 0.6 | 0.1 |
| Basin Stockpile Wind Erosion | | | 1.4 | | | | 3.5 | Partial enclosure (3 walls 6.5 ft) | 30 | 0.6 | 0.6 | 0.6 |
| | | | | | | | | | **TOTAL** | **5.8** | **3.1** | **1.0** |

Notes:

(1) Sales maximum design throughput for the SRUs (East and West) = 550 tpd

Example: Basin Sulfur Handling Rate = 550 ton/day * 365 day/yr = 200,750 tpy

(2) Site data

(3) Uncontrolled emission factor per AP-42, Chapter 13.2.4, Equation 1 (valid for moisture content range of 0.25 - 4.8 %, silt content range of 0.44 - 19%)

E (lb/ton) = k * 0.0032 * (U/5)^1.3 / (M/2)^1.4

AP-42, Chapter 13.2.4-4, particle size multiplier (k):

| | | |
|---|---|---|
| k (PM) = | 0.74 | (AP-42, 13.2.4-4, Aerodynamic Particle Size Multiplier (k) for particle size < 30 µm) |
| k (PM10) = | 0.35 | (AP-42, 13.2.4-4, Aerodynamic Particle Size Multiplier (k) for particle size < 10 µm) |
| k (PM2.5) = | 0.053 | (AP-42, 13.2.4-4, Aerodynamic Particle Size Multiplier (k) for particle size < 2.5 µm) |
| U = | 8.8 | mph. Average wind speed based on 2009 and 2010 data from Cottage Meteorological Station |
| M = | 1.0 | % (from product specifications) |

Example: PM Uncontrolled Emission Factor = 0.74 * 0.0032 * (8.8/5)^1.3 / (1.0/2)^1.4 = 0.013 lb/ton

(4) Uncontrolled emission factor is estimated using the AP-42 drop point equation ratioed to the conveyor length.

E (lb/ton) = k * 0.0032 * (U/5)^1.3 / (M/2)^1.4 * Conveyor Length Ratio

Conveyor Length Ratio = Conveyor Length (ft) / 300 ft

Example: PM Uncontrolled Conveyor Adjusted Emission Factor = 0.74 * 0.0032 * (8.8/5)^1.3 / (1.0/2)^1.4 * 560 ft/300 ft = 0.024 lb/ton

(5) Stockpile wind erosion emission factor per CHEER (Coal Handling Emissions Evaluation Roundtable) Workshop, TNRCC (May 16, 1995) and per EPA-450/3-74-037 Development of Emission Factors for Fugitive Dust Sources (EPA, June 1974)

(6) Control efficiency per CHEER (Coal Handling Emissions Evaluation Roundtable) Workshop, TNRCC (May 16, 1995):

| | Control Efficiency | |
|---|---|---|
| Rain covers | 50 | 40-50% depends on air gaps between cover edge and belt |
| Established wind breaks | 30 | The stockpile is surrounded by 6.5ft walls in two sides and a fence towards the docks |

(7) Annual Potential to Emit (Drop Points) = Sulfur Production Rate (ton/yr) * Uncontrolled Emission Factor (lb/ton) * (1 - Control Eff) * 1 ton/2,000 lb

Example: PM Emissions from West SRUs Drop from Conveyor to Stockpile = 200,750 ton/yr * 0.013 lb/ton * (1 - 0) * 1 ton/2,000 lb = 1.31 tpy

(8) Annual Potential to Emit (Stockpiles) = Stockpile Area (acres) * Wind Erosion Emission Factor (lb/acre-day) * 365 days/yr * (1 - Control Eff) * 1 ton/2,000 lb

Example: PM Emissions from West SRUs Stockpile Wind Erosion = 1.4 acres * 3.5 lb/acre-day * 365 days/yr * (1 - 0.3) * 1 ton/2,000 lb = 0.63 tpy

## Limetree Bay Terminals and Refining
## B-22 Coke Handling and Storage Annual Potential to Emit

**Description**: The four coke drums operate in pairs. As two drums are filled, the other two are emptied. Solidified coke is cut with a steam lance drilled from the top of the drum and dropped to the below grade pit. Chunks of wet coke drop from the drums into the pit. The pit is below grade and is surrounded by 20 ft concrete walls (4 sides). Coke is transferred from the pit to a concrete pad inside the walled enclosure with a clam shell (or with front-end loaders for up to 12 hr a month for maintenance of the clam shell). The wet coke is crushed in the MC-8601 crusher. The crusher grinds the coke and drops it into the conveyor belt for transfer to the two storage domes located by the Docks. The conveyor belts are fully enclosed, ventilated with fans and no dust collection. The domes are fully enclosed and equipped with dust collectors. From the domes, the reclaiming conveyors feed the Ship Loading Gallery (SL-8601). The radial loading arm SL-8601 is controlled with a dust collector. Coke is transferred to the ship by means of an adjustable chute that helps reducing the drop into the hull of the ship.

**Table 1 - Fugitive Particulate Coke Handling & Storage**

| Activity | Annual Potential to Emit (tpy)[1] | | |
|---|---|---|---|
| | PM | PM10 | PM2.5 |
| Drop points | 1.2 | 0.5 | 0.1 |
| MC-8601 Crusher | 1.3 | 1.3 | 1.3 |
| Conveyor Belts | 1.1 | 0.5 | 0.1 |
| Domes 1 & 2 Vents | 0.1 | 0.0 | 0.0 |
| Radial Loader Vent | 0.7 | 0.7 | 0.7 |
| **TOTAL** | **4.4** | **3.1** | **2.3** |

Notes:
(1) Refer to tables 2-4 for detailed calculations

**Limetree Bay Terminals and Refining**
**B-22 Coke Handling and Storage Annual Potential to Emit**

**Table 2 - Coke Handling Transfers and Crusher Particulate Emissions**

| Activity | Uncontrolled Emission Factor (lb/ton)[(1),(2)] | | | Coke Handling Rate (tpy)[(3)] | Max. Operating Hours (hr/yr)[(4)] | Controls Description | Control Efficiency (%)[(5)] | Annual Potential to Emit (tpy)[(6),(7)] | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | PM | PM10 | PM2.5 | | | | | PM | PM10 | PM2.5 |
| Wet coke drop from the bottom of the coke drums , (D-8501, D-8502, D-8503, D-8504) to the below grade pit | 0.001 | 0.001 | 0.0001 | 1,338,462 | 8,760 | Wet coke (8.1% moisture) Partial enclosure (4 walls) | 75 | 0.24 | 0.12 | 0.02 |
| Wet coke transfer with a clam shell (or front-end loaders) from the concrete pit to the concrete pad | 0.001 | 0.001 | 0.0001 | 1,338,462 | 8,760 | Wet coke (8.1% moisture) Partial enclosure (4 walls) | 75 | 0.24 | 0.12 | 0.02 |
| Wet coke transfer with clam shell (or front-end loaders) from the concrete pad to the crusher MC-8601 | 0.001 | 0.001 | 0.0001 | 1,338,462 | 8,760 | Wet coke (8.1% moisture) Partial enclosure (4 walls) | 75 | 0.24 | 0.12 | 0.02 |
| MC-8601 Crusher | 0.02 | 0.02 | 0.02 | 1,338,462 | 8,760 | Completely enclosed except the drop funnel | 90 | 1.3 | 1.3 | 1.3 |
| Coke drop to the ship (following the radial loading arm, refer to Table 3) | 0.001 | 0.001 | 0.0001 | 1,338,462 | 8,760 | Reduce fall distance (sock) | 50 | 0.45 | 0.15 | 0.03 |
| | | | | | | | **TOTAL** | **2.5** | **1.8** | **1.4** |

Notes:
(1) Uncontrolled emission factor for transfer points per AP-42, Chapter 13.2.4, Equation 1 (valid for moisture content range of 0.25 - 4.8 %, silt content range of 0.44 - 19%):
E (lb/ton) = k * 0.0032 * (U/5)^1.3 / (M/2)^1.4
Where:

| | | |
|---|---|---|
| k (PM) = | 0.74 | (AP-42, 13.2.4-4, Aerodynamic Particle Size Multiplier (k) for particle size < 30 μm) |
| k (PM10) = | 0.35 | (AP-42, 13.2.4-4, Aerodynamic Particle Size Multiplier (k) for particle size < 10 μm) |
| k (PM2.5) = | 0.053 | (AP-42, 13.2.4-4, Aerodynamic Particle Size Multiplier (k) for particle size < 2.5 μm) |
| U = | 8.8 | mph. Average wind speed based on 2009 and 2010 data from Cottage Meteorological Station |
| M = | 4.8 | % max equation range (refer to Note 6) |

Example: PM Uncontrolled Emission Factor = 0.74 * 0.0032 * (8.8/5)^1.3 / (4.8/2)^1.4 = 0.001 lb/ton
(2) Uncontrolled emission factor for the Crusher MC-8601 per CHEER (Coal Handling Emissions Evaluation Roundtable) Workshop, TNRCC (May 16, 1995).
Recommended emission factor for the primary crusher of coke (0.02 lb/ton) and for the secondary crusher (0.06 lb/ton)
(3) Annual coke handling rate:

| | Coker Charge (FOEB/yr) | Coker Charge (MBPD) | Coke Handling (tpy) | |
|---|---|---|---|---|
| Coker | | 65 | 1,500,000 | 1998 design |
| Coker | 21,170,000 | 58 | 1,338,462 | Title V, 3.1.17.7 (black font) |

(4) Coker handling operates 8,760 hr/yr. Front-end loaders operate only during maintenance of the clam shell. Assumed one 12 hr period a month is necessary.
(5) Control efficiency per CHEER (Coal Handling Emissions Evaluation Roundtable) Workshop, TNRCC (May 16, 1995):

| | Control Efficiency | |
|---|---|---|
| Wet material | 50 | Wet material 30 - 50 % depends on surface moisture content, amount of time for water application. The average moisture was measured to be 8.1%wt |
| Partial enclosure | 50 | Partial enclosures 30-50% depends on equipment |
| Full enclosure | 90 | Ventilated, no dust collection |
| Reduce fall distance | 50 | 30-50% includes adjustable chutes |

Example: Coke Drums Control Efficiency = 1 - [(1 - 0.5) * (1 - 0.5)] = 75%
(6) Title V Section 3.1.17 Group 17 - Coker Complex

| | STX-TV-003-10 Condition | Coke Moisture (%) Equal or Greater | PM (lb/yr) | PM10 (lb/yr) |
|---|---|---|---|---|
| Coke Drum Drop Operations | 3.1.17.10 | 4.8 | 900 | 300 |
| Coke Crusher Drop Operations | 3.1.17.11 | 4.8 | 900 | 300 |
| Coke Crusher Operations | 3.1.17.14 | 4.8 | 9,450 | 4,500 |
| Coke Drop Operations to the Ship | 3.1.17.12 | 4.8 | 900 | 300 |

(7) Annual Potential to Emit (tpy) = MIN{Title V Limit; Uncontrolled Emission Factor (lb/ton) * Coke Production Rate (ton/yr) * (1 - Control Efficiency) * 1 ton/2,000 lb}
Example: PM Coke Drums Annual Potential to Emit = MIN{ [900lb/yr * 1 ton/2,000 lb] ; [ 0.001 lb/ton * 1,338,462 ton/yr * (1 - 0.75) * 1 ton/2,000 lb ] } = MIN{0.45 tpy ; 0.24 tpy} = 0.24 tpy

## Limetree Bay Terminals and Refining
## B-22 Coke Handling and Storage Annual Potential to Emit

**Table 3 - Coke Handling Conveyors Particulate Emissions**

| Activity | Fan ID | Conveyor Belt Length (ft)[1] | Uncontrolled Emission Factor (lb/ton)[2] | | | Coke Handling Rate (tpy)[3] | Max. Operating Hours (hr/yr)[4] | Controls Description | Control Efficiency (%)[5] | Annual Potential to Emit (tpy)[6] | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | PM | PM10 | PM2.5 | | | | | PM | PM10 | PM2.5 |
| MC-8604 Conveyor (DCU to Dome 1) | C-8606<br>C-8607<br>C-8608 | 822 | 0.004 | 0.002 | 0.0003 | 1,338,462 | 8,760 | Ventilated. No dust collector | 90 | 0.3 | 0.1 | 0.02 |
| MC-8606 Conveyor (DCU to Dome 2) | C-8610<br>C-8611 | 299 | 0.001 | 0.001 | 0.0001 | 1,338,462 | 8,760 | Ventilated. No dust collector | 90 | 0.1 | 0.05 | 0.01 |
| MC-8609 Conveyor (Dome 1 to Ship Loading) | C-8612 | 259 | 0.001 | 0.001 | 0.0001 | 1,338,462 | 8,760 | Ventilated. No dust collector | 90 | 0.1 | 0.04 | 0.006 |
| MC-8610 Conveyor (Dome 2 to Ship Loading) | C-8619 | 243 | 0.001 | 0.001 | 0.0001 | 1,338,462 | 8,760 | Ventilated. No dust collector | 90 | 0.1 | 0.04 | 0.01 |
| MC-8611 Conveyor (Domes 1&2 to Ship Loading) | C-8614<br>C-8615<br>C-8616<br>C-8617 | 1,308 | 0.006 | 0.003 | 0.0005 | 1,338,462 | 8,760 | Ventilated. No dust collector | 90 | 0.4 | 0.2 | 0.03 |
| SL-8601 Ship Loading Gallery | C-8621<br>C-8622 | 450 | 0.002 | 0.001 | 0.0002 | 1,338,462 | 8,760 | Ventilated. No dust collector | 90 | 0.1 | 0.1 | 0.01 |
| | | | | | | | | | **TOTAL** | 1.1 | 0.5 | 0.1 |

Notes:

(1) Conveyor belt length per engineering drawings

(2) Uncontrolled emission factor is estimated using the AP-42 drop point equation ratioed to the conveyor length. AP-42, Chapter 13.2.4, Equation 1 (valid for moisture content range of 0.25 - 4.8 %, silt content range of 0.44 - 19%)

E (lb/ton) = k * 0.0032 * (U/5)^1.3 / (M/2)^1.4 * Conveyor Length Ratio

Conveyor Length Ratio = Conveyor Length (ft) / 300 ft

AP-42, Chapter 13.2.4-4, particle size multiplier (k):

| | | |
|---|---|---|
| k (PM) = | 0.74 | (AP-42, 13.2.4-4, Aerodynamic Particle Size Multiplier (k) for particle size < 30 µm) |
| k (PM10) = | 0.35 | (AP-42, 13.2.4-4, Aerodynamic Particle Size Multiplier (k) for particle size < 10 µm) |
| k (PM2.5) = | 0.05 | (AP-42, 13.2.4-4, Aerodynamic Particle Size Multiplier (k) for particle size < 2.5 µm) |
| U = | 8.83 | mph. Average wind speed based on 2009 and 2010 data from Cottage Meteorological Station |
| M = | 4.80 | % max equation range (refer to Note 6) |

Example: MC-8604 Conveyor PM Uncontrolled Emission Factor = 0.74 * 0.0032 * (8.8/5)^1.3 / (4.8/2)^1.4 * 822 / 300 = 0.004 lb/ton

(3) Annual coke handling rate:

| | Coker Charge (FOEB/yr) | Coker Charge (MBPD) | Coke Handling (tpy) | |
|---|---|---|---|---|
| Coker | | 65 | 1,500,000 | 1998 design |
| Coker | 21,170,000 | 58 | 1,338,462 | Title V, 3.1.17.7 (black font) |

(4) Coker handling operates 8,760 hr/yr.

(5) Control efficiency per CHEER (Coal Handling Emissions Evaluation Roundtable) Workshop, TNRCC (May 16, 1995):

| | Control Efficiency | |
|---|---|---|
| Full enclosure, ventilated, no dust collector | 90+ | summary of control efficiencies, page 34 |

(6) Annual Potential to Emit (tpy) = Uncontrolled Emission Factor (lb/ton) * Coke Production Rate (ton/yr) * (1 - Control Efficiency) * 1 ton/2,000 lb

Example: MC-8604 Conveyor PM Annual Potential to Emit = 0.004 lb/ton * 1,338,462 ton/yr * (1 - 0.90) * 1 ton/2,000 lb = 0.3 tpy

## Limetree Bay Terminals and Refining
## B-22 Coke Handling and Storage Annual Potential to Emit

**Table 4 - Coke Handling Vents Particulate Emissions**

| Activity | Fan ID | Flowrate (acfm)(1) | Temperature (°F)(2) | Dust Collector Flowrate (dscfm)(3) | Dust Collector Efficiency (gr/dscf)(4) | Annual Potential to Emit (tpy)(5),(6),(7) | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | PM | PM10 | PM2.5 |
| Dome 1 Vent BLD-8601 | F-8601 | 20,000 | 87 | 19,293 | 0.005 | 0.05 | 0.02 | 0.02 |
| Dome 2 Vent BLD-8602 | F-8602 | 20,000 | 87 | 19,293 | 0.005 | 0.05 | 0.02 | 0.02 |
| Radial Loading Arm SL-8601 | F-8603 | 4,000 | 87 | 3,859 | 0.005 | 0.7 | 0.7 | 0.7 |
| | | | | | **TOTAL** | **0.8** | **0.8** | **0.8** |

Notes:

(1) Exhaust fan specifications

(2) Maximum annual temperature for 2009-2010

(3) Flowrate (dscfm) = Flowrate (acfm) * Standard Temp (°R) / Exhaust Temp (°R)

Example: Dome 1 F-8601 = 20,000 acfm * (68 + 459.67) / (87 + 459.67) = 19,293 dscfm

(4) LAER limit for dust collection

(5) Title V Section 3.1.17 Group 17 - Coker Complex

| | Title V | PM (lb/yr) | PM10 (lb/yr) |
|---|---|---|---|
| Coke Storage Dome Vents | 3.1.17.13 | 90 | 30 |

(6) Annual Potential to Emit (tpy) = MIN { Title V Limit; Emission Factor (gr/dsfc) * Dust Collector Flowrate (dscfm) * 60 min/1hr * 8,760 hr/yr * 1 lb/7,000 gr * 1 ton/2,000 lb}

Example: PM Emissions Dome 1 Vent BLD-8601 = MIN { 90 lb/yr * 1 ton/2,000 lb; 0.005 gr/dscf * 19,293 dscf/min * 60 min/hr * 8,760 hr/yr * 1 lb/7,000 gr * 1 ton/2,000 lb } = MIN { 0.05 tpy; 3.62 tpy} = 0.05 tpy

(7) Annual Potential to Emit (tpy) = Emission Factor (gr/dsfc) * Dust Collector Flowrate (dscfm) * 60 min/1hr * 8,760 hr/yr * 1 lb/7,000 gr * 1 ton/2,000 lb

Example: PM Emissions Radial Loading Arm SL-8601 = 0.005 gr/dscf * 3,859 dscf/min * 60 min/hr * 8,760 hr/yr * 1 lb/7,000 gr * 1 ton/2,000 lb = 0.7 tpy

## Limetree Bay Terminals and Refining
## B-23 FCC Catalyst Handling & Storage Annual Potential to Emit

**Description**: emissions associated with the FCC catalyst handling include three drop points: load to the hopper, load from the hopper to the reactor and unloading of the reactor. The load to the reactor is partially enclosed, as the reactor only vents on the top. The unloading of the reactor is conducted using a loading sock that reduces the fall distance. alternatively, the unloading of the reactor may occur through a vacuum system on the drum containers or after the catalyst is wetted with steam.

**Table 1 - Catalyst Handling Particulate Emissions**

| Activity | Uncontrolled Emission Factor (lb/ton)(1) | | | Catalyst Handling Rate (tpy)(2) | Controls Description | Control Efficiency (%)(5) | Annual Potential to Emit (tpy)(6),(7) | | |
|---|---|---|---|---|---|---|---|---|---|
| | PM | PM10 | PM2.5 | | | | PM | PM10 | PM2.5 |
| Catalyst Load to Hopper | 0.035 | 0.016 | 0.0025 | 1,491.8 | None | - | 0.03 | 0.01 | 0.002 |
| Catalyst Load to Reactor | 0.035 | 0.016 | 0.0025 | 1,491.8 | Partial enclosure | 50 | 0.01 | 0.01 | 0.001 |
| Catalyst Drop Out of Reactor | 0.035 | 0.016 | 0.0025 | 1,565.93 | Reduce fall distance or wet material | 50 | 0.01 | 0.01 | 0.001 |
| | | | | | | **TOTAL** | **0.05** | **0.02** | **0.004** |

Notes:

(1) Uncontrolled emission factor for transfer points per AP-42, Chapter 13.2.4, Equation 1 (valid for moisture content range of 0.25 - 4.8 %, silt content range of 0.44 - 19%):

E (lb/ton) = k * 0.0032 * (U/5)^1.3 / (M/2)^1.4

Where:

| | | |
|---|---|---|
| k (PM) = | 0.74 | (AP-42, 13.2.4-4, Aerodynamic Particle Size Multiplier (k) for particle size < 30 μm) |
| k (PM10) = | 0.35 | (AP-42, 13.2.4-4, Aerodynamic Particle Size Multiplier (k) for particle size < 10 μm) |
| k (PM2.5) = | 0.053 | (AP-42, 13.2.4-4, Aerodynamic Particle Size Multiplier (k) for particle size < 2.5 μm) |
| U = | 8.8 | mph. Average wind speed based on 2009 and 2010 data from Cottage Meteorological Station |
| M = | 0.5 | %. Product specifications vary from 0 - 3% for most catalyst. Most are hydroscopic. |

Example: PM Uncontrolled Emission Factor = 0.74 * 0.0032 * (8.8/5)^1.3 / (0.5/2)^1.4 = 0.035 lb/ton

(2) Catalyst handling rate. For purposes of PTE a 25% increase over 2009/2010 data was applied.

| | 2009 (lbs) | 2010 (lbs) | Max. Rate + 25% (lbs) |
|---|---|---|---|
| Catalyst onsite | 8,895,096 | 7,896,557 | 11,118,870 |
| Catalyst Loaded | 2,386,954 | 1,154,393 | 2,983,693 |
| Catalyst Shipped | 2,505,481 | 432,533 | 3,131,851 |

(3) Control efficiency per CHEER (Coal Handling Emissions Evaluation Roundtable) Workshop, TNRCC (May 16, 1995):

| | Control Efficiency | |
|---|---|---|
| Partial enclosure | 50 | Partial encolosures 30-50% depends on equipment |
| Reduce fall distance | 50 | 30-50% includes adjustable chutes |
| Wet material | 50 | Wet material 30 - 50 % depends on surface moisture content, amount of time for water application. |

(4) Annual Potential to Emit (tpy) = Catalyst Handling Rate (ton/yr) * (1 - Control Efficiency) * 1 ton/2,000 lb

Example: PM Load to Reactor Annual Potential to Emit = 0.035 lb/ton * 1,492 ton/yr * (1 - 0.50) * 1 ton/2,000 lb = 0.01 tpy

## Limetree Bay Terminals
## B-24 Road Dust Annual Potential to Emit

**Description**: up to 250 vehicle fleet is used daily at the facility. The quantity of particulate emissions from resuspension of loose material on the road surface due to vheicle travel on dry paved road is estimated using AP-42 Chapter 13.2.

**Table 1 - Road Dust Potential to Emit**

| Parameter | Units | PM | PM10 | PM2.5 |
|---|---|---|---|---|
| Max. Vehicle Miles Travelled(1) | miles/day/vehicle | 10 | | |
| No. Leased/Owned Vehicles(1) | vehicle | 250 | | |
| Max. Fleet VMT per Year(2) | VMT/yr | 912,500 | | |
| Road Surface Silt, sL(3) | g/m2 | 1.1 | | |
| Average Weight of Vehicles in Road, W(1) | tons | 4 | | |
| Days with > 0.01 inches rain, P(4) | days | 154 | | |
| Days in Averaging Period, N | days | 365 | | |
| Particle Size Multiplier, k(5) | lb/MVT | 0.011 | 0.0022 | 0.00054 |
| Emission Factor, E(6) | lb/VMT | 0.044 | 0.009 | 0.002 |
| Annual Emissions(7) | tpy | 20.1 | 4.0 | 1.0 |

Notes:

(1) Site data

(2) Max. Fleet VMT (VMT/yr) = Max. Vehicle Miles Travelled (miles/day/vehicle) * No. Vehicles (vehicle) * 365 days/yr

Example: Max. Fleet VMT = 10 miles/day/vehicle * 250 vehicle * 365 day/yr = 912,500 VMT/yr

(3) Road Surface Silt for Corn wet mills per AP-42, Chapter 13.2, Table 13.2.1-3

(4) Average Days with > 0.01 inches rain for 2009 and 2010. Based on meteorological station records

(5) Particle size multiplier for paved road per AP-42, Chapter 13.2, Table 13.2.1-1 for PM30, PM10 and PM2.5

(6) Emission factor per AP-42, Chapter 13.2, Equation 2

E = k * sL^0.91 * W^1.02 * (1 - P/4N)

Example: PM E = 0.011 * 1.1^0.91 * 4^1.02 * (1 - 154 / (4 * 365)) = 0.044 lb/MVT

(7) Annual Emissions = Max. Fleet VMT/yr * E (lb/VMT) * 1 ton/2,000 lb

Example: Annual PM Emissions = 912,500 VMT/yr * 0.044 lb/MVMT * 1 ton/2,000 lb = 20.1 tpy

## Limetree Bay Terminals
## B-25 Painting Annual Potential to Emit

**Description**: the facility utilizes paint for multiple purposes. The estimated potential to emit is based on usage in years 2009 and 2010 plus a 30%. VOC calculations for paints and thinners were developed for calendar years 2009 and 2010 using the total VOC weight percent in typical paints and thinners used on site times the total usage per site records. For paints, 100% of the VOC content is assumed to be emitted. For thinners, 28% of the VOC content is assumed to be emitted, since approximately 20% of thinners used are mixed with the paint, and the rest (80%) is used for cleaning. Of that 80%, it was assumed that 10% volatilizes during the day before it is shipped out as waste.

| Product | 2009 (lbs) | 2010 (lbs) | Max. Rate CY09 & CY10 + 30% (lbs) | VOC (tpy) |
|---|---|---|---|---|
| Paint VOC | 10,986 | 17,305 | 21,631 | 11 |
| Thinner VOC | 23,126 | 22,230 | 28,907 | 4 |
| | | | **TOTAL PTE** | **15** |

## Limetree Bay Terminals and Refining
## B-26 Firefighter Training Potential to Emit

| Air Pollutant | Emission Factor ($lb_{pollutant}/lb_{fuel}$)(1) | Gasoline Firefighting Training | | | Diesel Firefighting Training | | | LPG Firefighting Training | | | Annual Emissions (tpy)(5) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Fuel Burned in Training (gal/yr)(2) | Fuel Density (lb/gal)(3) | Emissions (tpy)(4) | Fuel Burned in Training (gal/yr)(2) | Fuel Density (lb/gal)(3) | Emissions (tpy)(4) | Fuel Burned in Training (gal/yr)(2) | Fuel Density (lb/gal)(3) | Emissions (tpy)(4) | |
| SOx | - | | | - | | | | | | - | - |
| NOx | 0.0042 | | | 0.03 | | | 0.03 | | | 0.01 | 0.1 |
| CO | 0.56 | | | 3.4 | | | 3.8 | | | 1.7 | 8.9 |
| PM | 0.128 | 1,950 | 6.17 | 0.8 | 1,950 | 7.05 | 0.9 | 1,300 | 4.54 | 0.4 | 2.0 |
| PM10 | 0.128 | | | 0.8 | | | 0.9 | | | 0.4 | 2.0 |
| PM2.5 | 0.128 | | | 0.8 | | | 0.9 | | | 0.4 | 2.0 |
| VOC | 0.32 | | | 1.9 | | | 2.2 | | | 0.9 | 5.1 |

Notes

(1) Emission factors for life fire traing (JP-4) per "Calculation Methods for Criteria Air Pollutant Emission Inventories", Brooks Air Force Base, TX, July 1994

(2) Based in 2009 firefighter trainging records plus 30%

(3) AP-42, Appendix A. For LPG average of liquid butane and liquid propane density.

(4) Emissions (tpy) = Emission Factor (lbpollutant/lbfuel) * Fuel Burned (gal/yr) * Fuel Density (lb/gal) * 1 ton/2,000 lb

Example: CO Gasoline Firefighting Training Emissions = 0.56 lb/lb * 1,950 gal/yr * 6.17 lb/gal * 1 ton/2000 lb = 3.37 tpy

(5) Annual Emissions (tpy) = Gasoline Emissions (tpy) + Diesel Emissions (tpy) + LPG Emission (tpy)

Example: CO Annual Emissions = 3.4 tpy + 3.8 tpy + 1.7 tpy = 8.9 tpy

# Appendix C
# Baseline Emission Calculations

**Table C-1 Summary of Combustion Units VOC BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #2 DU Fractionator | H-101 | Y | Heater/Boiler | Heater | Existing | 146 | 791,295 | 43,469 | Emission Factor | 5.39E-03 | 5.14E-03 | 2.25 | 1.12 | 1.12 | - |
| #2 DU Fractionator | H-104 | Y | Heater/Boiler | Heater | Existing | 108 | 654,318 | 40,043 | Emission Factor | 5.39E-03 | 5.14E-03 | 1.87 | 0.93 | 0.93 | - |
| #2 CDU | H-401A | Y | Heater/Boiler | Charge Heater | Existing | 171 | 828,797 | 257,804 | Emission Factor | 5.39E-03 | 5.14E-03 | 2.90 | 1.45 | 1.45 | - |
| #2 CDU | H-401B | Y | Heater/Boiler | Charge Heater | Existing | 171 | 828,797 | 257,804 | Emission Factor | 5.39E-03 | 5.14E-03 | 2.90 | 1.45 | 1.45 | - |
| #2 CDU | H-401C | Y | Heater/Boiler | Charge Heater | Existing | 171 | 828,797 | 257,804 | Emission Factor | 5.39E-03 | 5.14E-03 | 2.90 | 1.45 | 1.45 | - |
| #3 DD | C-1500A | Y | Compressor | Reciprocating Gas Compressor | Existing | 3 | 15,104 | 0 | Emission Factor | 2.96E-02 | | 0.22 | 0.11 | 0.11 | - |
| #3 DD | C-1500B | Y | Compressor | Reciprocating Gas Compressor | Existing | 3 | 15,104 | 0 | Emission Factor | 2.96E-02 | | 0.22 | 0.11 | 0.11 | - |
| #3 DD | C-1500C | Y | Compressor | Reciprocating Gas Compressor | Existing | 3 | 15,104 | 0 | Emission Factor | 2.96E-02 | | 0.22 | 0.11 | 0.11 | - |
| Penex | H-200 | Y | Heater/Boiler | Charge Heater | Existing | 37 | 389,579 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 1.05 | 0.53 | 0.53 | - |
| Penex | H-201 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 37 | 395,352 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 1.07 | 0.53 | 0.53 | - |
| Penex | H-202 | Y | Heater/Boiler | Hot Oil Heater | Existing | 122 | 874,691 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 2.36 | 1.18 | 1.18 | - |
| Penex | C-200A | Y | Compressor | Reciprocating Gas Compressor | Existing | 9 | 75,121 | 0 | Emission Factor | 2.96E-02 | | 1.11 | 0.56 | 0.56 | - |
| Penex | C-200B | Y | Compressor | Reciprocating Gas Compressor | Existing | 9 | 75,121 | 0 | Emission Factor | 2.96E-02 | | 1.11 | 0.56 | 0.56 | - |
| Penex | C-200C | Y | Compressor | Reciprocating Gas Compressor | Existing | 9 | 75,121 | 0 | Emission Factor | 2.96E-02 | | 1.11 | 0.56 | 0.56 | - |
| Utility Fractionation | H-160 | Y | Heater/Boiler | Charge Heater | Existing | 135 | 884,143 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 2.38 | 1.19 | 1.19 | - |
| #2 Platformer | H-601 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 36 | 221,021 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 0.60 | 0.30 | 0.30 | - |
| #2 Platformer | H-604 | Y | Heater/Boiler | Platforming No. 2 Interheater | Existing | 37 | 214,990 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 0.58 | 0.29 | 0.29 | - |
| #2 Platformer | H-605 | Y | Heater/Boiler | Platforming No. 3 Interheater | Existing | 15 | 59,776 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 0.16 | 0.08 | 0.08 | - |
| #2 DU | H-800A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 43 | 461,566 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 1.24 | 0.62 | 0.62 | - |
| #2 DU | H-800B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 43 | 441,880 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 1.19 | 0.60 | 0.60 | - |
| #2 DU | H-801 | Y | Heater/Boiler | Stripper Heater | Existing | 101 | 803,114 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 2.17 | 1.08 | 1.08 | - |
| #4 DD | H-2201A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 61 | 690,666 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 1.86 | 0.93 | 0.93 | - |
| #4 DD | H-2201B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 61 | 690,666 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 1.86 | 0.93 | 0.93 | - |
| #4 DD | H-2202 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 119 | 980,002 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 2.64 | 1.32 | 1.32 | - |
| #5 DD | H-2400 | Y | Heater/Boiler | Charge Heater | Existing | 33 | 463,511 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 1.25 | 0.62 | 0.62 | - |
| #5 DD | C-2400A | Y | Compressor | Reciprocating Gas Compressor | Existing | 7 | 48,723 | 0 | Emission Factor | 2.96E-02 | | 0.72 | 0.36 | 0.36 | - |
| #5 DD | C-2400B | Y | Compressor | Reciprocating Gas Compressor | Existing | 7 | 48,723 | 0 | Emission Factor | 2.96E-02 | | 0.72 | 0.36 | 0.36 | - |
| Naphtha Fractionation | H-2501 | Y | Heater/Boiler | Reboiler Heater | Existing | 203 | 437,565 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 1.18 | 0.59 | 0.59 | - |

Table C-1 Summary of Combustion Units VOC BAE

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #2 Sulfolane | H-4502 | Y | Heater/Boiler | Benzene Column Reboiler Heater | Existing | 149 | 858,943 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 2.32 | 1.16 | 1.16 | - |
| #2 Sulfolane | H-4503 | Y | Heater/Boiler | Toluene Column Reboiler Heater | Existing | 141 | 753,962 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 2.03 | 1.02 | 1.02 | - |
| #2 Sulfolane | H-4504 | Y | Heater/Boiler | Xylene Column Reboiler Heater | Existing | 126 | 607,009 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 1.64 | 0.82 | 0.82 | - |
| #2 Sulfolane | H-4505 | Y | Heater/Boiler | Raffinate Splitter Reboiler Heater | Existing | 109 | 470,895 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 1.27 | 0.63 | 0.63 | - |
| #5 CDU | H-3101A | Y | Heater/Boiler | Crude Charge Heater | Existing | 381 | 2,184,815 | 614,217 | Emission Factor | 5.39E-03 | 5.14E-03 | 7.47 | 3.73 | 3.73 | - |
| #5 CDU | H-3101B | Y | Heater/Boiler | Crude Charge Heater | Existing | 381 | 2,436,185 | 659,430 | Emission Factor | 5.39E-03 | 5.14E-03 | 8.26 | 4.13 | 4.13 | - |
| #6 CDU | H-4101A | Y | Heater/Boiler | Crude Charge Heater | Existing | 381 | 2,446,267 | 516,409 | Emission Factor | 5.39E-03 | 5.14E-03 | 7.92 | 3.96 | 3.96 | - |
| #6 CDU | H-4101B | Y | Heater/Boiler | Crude Charge Heater | Existing | 381 | 2,817,416 | 557,900 | Emission Factor | 5.39E-03 | 5.14E-03 | 9.03 | 4.51 | 4.51 | - |
| #3 Platformer | H-4401 | Y | Heater/Boiler | Charge Heater | Existing | 134 | 1,025,393 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 2.76 | 1.38 | 1.38 | - |
| #3 Platformer | H-4402 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 128 | 721,833 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 1.95 | 0.97 | 0.97 | - |
| #3 Platformer | H-4451 | Y | Heater/Boiler | Charge Heater | Existing | 381 | 2,918,945 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 7.87 | 3.93 | 3.93 | - |
| #3 Platformer | H-4452 | Y | Heater/Boiler | Intermediate Heater | Existing | 248 | 1,803,863 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 4.86 | 2.43 | 2.43 | - |
| #3 Platformer | H-4453 | Y | Heater/Boiler | Intermediate Heater | Existing | 248 | 1,338,392 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 3.61 | 1.80 | 1.80 | - |
| #3 Platformer | H-4454 | Y | Heater/Boiler | Intermediate Heater | Existing | 77 | 518,276 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 1.40 | 0.70 | 0.70 | - |
| #3 Platformer | H-4455 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 138 | 1,076,287 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 2.90 | 1.45 | 1.45 | - |
| #3 VAC | H-4201 | Y | Heater/Boiler | Prestripper Heater | Existing | 253 | 1,195,811 | 545,534 | Emission Factor | 5.39E-03 | 5.14E-03 | 4.62 | 2.31 | 2.31 | - |
| #3 VAC | H-4202 | Y | Heater/Boiler | Vacuum Heater | Existing | 245 | 962,882 | 553,169 | Emission Factor | 5.39E-03 | 5.14E-03 | 4.02 | 2.01 | 2.01 | - |
| #4 Platformer | H-5401 | Y | Heater/Boiler | Charge Heater | Existing | 134 | 983,723 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 2.65 | 1.33 | 1.33 | - |
| #4 Platformer | H-5402 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 128 | 684,930 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 1.85 | 0.92 | 0.92 | - |
| #4 Platformer | H-5451 | Y | Heater/Boiler | Charge Heater | Existing | 381 | 2,059,984 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 5.55 | 2.78 | 2.78 | - |
| #4 Platformer | H-5452 | Y | Heater/Boiler | Intermediate Heater | Existing | 248 | 1,843,813 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 4.97 | 2.49 | 2.49 | - |
| #4 Platformer | H-5453 | Y | Heater/Boiler | Intermediate Heater | Existing | 248 | 1,356,092 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 3.66 | 1.83 | 1.83 | - |
| #4 Platformer | H-5454 | Y | Heater/Boiler | Intermediate Heater | Existing | 77 | 491,861 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 1.33 | 0.66 | 0.66 | - |
| #4 Platformer | H-5455 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 138 | 1,014,968 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 2.74 | 1.37 | 1.37 | - |
| #6 DD | H-4601A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 61 | 307,355 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 0.83 | 0.41 | 0.41 | - |
| #6 DD | H-4601B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 61 | 306,150 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 0.83 | 0.41 | 0.41 | - |
| #6 DD | H-4602 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 119 | 669,854 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 1.81 | 0.90 | 0.90 | - |
| #6 DD | C-4601A | Y | Compressor | Reciprocating Gas Compressor | Existing | 21 | 86,488 | 0 | Emission Factor | 1.18E-01 | | 5.10 | 2.55 | 2.55 | - |
| #6 DD | C-4601B | Y | Compressor | Reciprocating Gas Compressor | Existing | 21 | 86,488 | 0 | Emission Factor | 1.18E-01 | | 5.10 | 2.55 | 2.55 | - |
| #6 DD | C-4601C | Y | Compressor | Reciprocating Gas Compressor | Existing | 21 | 86,488 | 0 | Emission Factor | 1.18E-01 | | 5.10 | 2.55 | 2.55 | - |

**Table C-1 Summary of Combustion Units VOC BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #7 DD | H-4301A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 67 | 550,826 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 1.49 | 0.74 | 0.74 | - |
| #7 DD | H-4301B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 67 | 573,413 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 1.55 | 0.77 | 0.77 | - |
| #7 DD | H-4302 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 122 | 1,053,299 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 2.84 | 1.42 | 1.42 | - |
| #9 DD | H-5301A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 67 | 471,591 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 1.27 | 0.64 | 0.64 | - |
| #9 DD | H-5301B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 67 | 449,346 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 1.21 | 0.61 | 0.61 | - |
| #9 DD | H-5302 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 122 | 1,257,163 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 3.39 | 1.69 | 1.69 | - |
| LSG Unit | H-4901 | Y | Heater/Boiler | Charge Heater | Existing | 87 | 327,668 | 0 | Emission Factor | | | | 0.00 | | |
| Sulfuric Acid Plant | STK-7801 | Y | Heater/Boiler | Heater Stack | Existing | 30 | 73,671 | 0 | Emission Factor | | | | 0.00 | | |
| Sulfuric Acid Plant | H-7801 | Y | Heater/Boiler | Process Air Heater | Existing | | | | Emission Factor | | | | 0.00 | | |
| Sulfuric Acid Plant | H-7802 | Y | Heater/Boiler | Converter Heater | Existing | | | | Emission Factor | | | | 0.00 | | |
| Sulfuric Acid Plant | R-7801 | Y | Heater/Boiler | Startup Heater | Existing | | | | Emission Factor | | | | 0.00 | | |
| #1 SRU Incinerator | H-1032 | Y | Heater/Boiler | Tail Gas Incinerator | Existing | 7 | 9,702 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 0.03 | 0.01 | 0.01 | - |
| #2 SRU Incinerator | H-1042 | Y | Heater/Boiler | Tail Gas Incinerator | Existing | 15 | 73,434 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 0.20 | 0.10 | 0.10 | - |
| #1 Beavon | H-1061 | Y | TGTU | Sulfur Recovery Units, Tail gas treatment | Existing | 10 | 0 | 0 | | | | 12.22 | 6.11 | 6.11 | [B] |
| #2 Beavon | H-4761 | Y | TGTU | Tail Gas Treatment | Existing | 10 | 0 | 0 | | | | 27.58 | 13.79 | 13.79 | [B] |
| East Incinerator | H-4745 | Y | Heater/Boiler | Tail Gas Incinerator | Existing | 55 | 142,237 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 0.38 | 0.19 | 0.19 | - |
| Delayed Coker Unit | H-8501A | Y | Heater/Boiler | Coker process heater 1 | Existing | 200 | 2,480,262 | 0 | Emission Factor | 2007 Stack Test | | 0.95 | 0.47 | 0.47 | - |
| Delayed Coker | H-8501B | Y | Heater/Boiler | Coker process heater | Existing | 200 | 2,472,154 | 0 | Emission Factor | 2007 Stack Test | | 0.36 | 0.18 | 0.18 | - |
| Utility II | #5 Boiler (B-1155) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 539 | 1,765,918 | 811,841 | Emission Factor | 5.39E-03 | 5.14E-03 | 6.85 | 3.42 | 3.42 | - |
| Utility III | #6 Boiler (B-3301) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 257 | 1,271,145 | 480,095 | Emission Factor | 5.39E-03 | 5.14E-03 | 4.66 | 2.33 | 2.33 | [A] |
| Utility III | #7 Boiler (B-3302) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 257 | 1,133,369 | 511,268 | Emission Factor | 5.39E-03 | 5.14E-03 | 4.37 | 2.18 | 2.18 | [A] |
| Utility III | #8 Boiler (B-3303) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 512 | 2,503,750 | 1,163,089 | Emission Factor | 5.39E-03 | 5.14E-03 | 9.74 | 4.87 | 4.87 | - |
| Utility III | #9 Boiler (B-3304) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 512 | 1,976,231 | 977,844 | Emission Factor | 5.39E-03 | 5.14E-03 | 7.84 | 3.92 | 3.92 | - |
| Utility III | #10 Boiler (B-3701) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 225 | 1,532,157 | 0 | Emission Factor | 5.39E-03 | 5.14E-03 | 4.13 | 2.07 | 2.07 | - |
| Powerhouse 2 | GT No. 4 (G-3404) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 317 | 3,609,299 | 428,205 | Emission Factor | 2.10E-03 | 4.10E-04 | 3.88 | 1.94 | 1.94 | - |

**Table C-1 Summary of Combustion Units VOC BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Powerhouse 2 | GT No. 5 (G-3405) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 317 | 3,657,276 | 201,966 | Emission Factor | 2.10E-03 | 4.10E-04 | 3.88 | 1.94 | 1.94 | - |
| Powerhouse 2 | GT No. 7 (G-3407) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 317 | 3,981,360 | 474,168 | Emission Factor | 2.10E-03 | 4.10E-04 | 4.28 | 2.14 | 2.14 | - |
| Powerhouse 2 | GT No. 8 (G-3408) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 392 | 1,787,553 | 506,126 | Emission Factor | 2.10E-03 | 4.10E-04 | 1.98 | 0.99 | 0.99 | - |
| Powerhouse 2 | GT No. 9 (G-3409) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 304 | 4,439,104 | 280,162 | Emission Factor | 2.10E-03 | 4.10E-04 | 4.72 | 2.36 | 2.36 | - |
| Powerhouse 2 | GT No. 10 (G-3410) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 325 (5) | 3,551,385 | 207,405 | Emission Factor | 2.10E-03 | 4.10E-04 | 3.77 | 1.89 | 1.89 | - |
| GT No. 13 and Duct Burner | GT No. 13 (G-3413) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 626 | 5,968,643 | 546,683 | Emission Factor | 2.10E-03 | 4.10E-04 | 6.38 | 3.19 | 3.19 | - |
| | | | | | | | | | | | | Total tpy | 137.60 | 137.60 | |

Notes: "-" indicates no adjustments to the BAE were required.

[A] Emissions were downwardly adjusted for fuel oil usage of 35 barrels (bbls) above the combined 800 bbls/day limit for Boilers 6 & 7. Adjustment assumes equal firing rate for Boilers 6 & 7.

[B] Emissions based on tail gas flowrates and COS and CS2 composition data.

**Table C-2 Summary of Non-Combustion Units VOC BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Emission Calculation Parameter | Baseline Period 24 Month Parameter Total | Units | Emission Factor/Method | Emission Factor Units | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #2DU Fractionator | #2 DU Fractionator Process Unit | Y | Fugitive | Process Fugitives & Compressors | Existing | Component Count and Service | | | AP-42 | | | 11.80 | 11.78 | [B] |
| #2 CDU | #2 CDU Process Unit | Y | Fugitive | Process Fugitives | Existing | Component Count and Service | | | AP-42 | | | 27.15 | 12.60 | [B] |
| #3 CDU / 1 VAC | #3 CDU and 1 VAC Process Units | Y | Fugitive | Process Fugitives | Existing | Component Count and Service | | | AP-42 | | | 23.75 | 13.68 | [B] |
| #3 DD | #3 DD Process Unit | Y | Fugitive | Process Fugitives & Compressors | Existing | Component Count and Service | | | AP-42 | | | 23.10 | 7.41 | [B] |
| Penex | Penex Process Unit | Y | Fugitive | Process Fugitives & Compressors | Existing | Component Count and Service | | | AP-42 | | | 26.16 | 9.80 | [B] |
| #3,4,5 Amine | Unit No. 0920 | Y | Fugitive | Process Fugitives & Compressors | Existing | Component Count and Service | | | AP-42 | | | 0.32 | 0.29 | [B] |
| Utility Fractionation | Utility Fractionation Process Unit | Y | Fugitive | Process Fugitives | Existing | Component Count and Service | | | AP-42 | | | 2.16 | 2.14 | [B] |
| #2 Platformer | #2 Platformer Process Unit | Y | Fugitive | Process Fugitives & Co | Existing | Component Count and Service | | | AP-42 | | | 16.87 | 6.05 | [B] |
| #2 DU | #2 DU Process Unit | Y | Fugitive | Process Fugitives | Existing | Component Count and Service | | | AP-42 | | | 51.18 | 15.63 | [B] |
| #2 VAC | #2 VAC Process Unit | Y | Fugitive | Process Fugitives | Existing | Component Count and Service | | | AP-42 | | | 11.24 | 11.09 | [B] |
| #2 VIS | #2 VIS Process Unit | Y | Fugitive | Process Fugitives | Existing | Component Count and Service | | | AP-42 | | | 4.97 | 4.95 | [B] |
| #4 DD | #4 DD Process Unit | Y | Fugitive | Process Fugitives & Co | Existing | Component Count and Service | | | AP-42 | | | 29.79 | 11.39 | [B] |
| #5 DD | #5 DD Process Unit | Y | Fugitive | Process Fugitives & Co | Existing | Component Count and Service | | | AP-42 | | | 19.80 | 6.65 | [B] |
| Naphtha Fractionati | Naphtha Fractionation Process Unit | Y | Fugitive | Process Fugitives | Existing | Component Count and Service | | | AP-42 | | | 1.65 | 1.58 | [B] |
| #2 Platformer | #2 Plat Vent | Y | Process | Plat No. 2 Catalyst Regen Vent | Existing | Throughput | 4,307 | Mbbls | 0.0048 | lb/Mbbl | 0.01 | 0.01 | 0.01 | - |
| Hydrogen Concentration Unit | Unit No. 0801 | Y | Fugitive | Hydrogen Recovery | Existing | Component Count and Service | | | AP-42 | | | 42.43 | 11.15 | [B] |
| #1 Gas Recovery Unit | Unit No. 2300 | Y | Fugitive | Gas Stripper | Existing | Component Count and Service | | | AP-42 | | | Included with Unit No. 0801 | Included with Unit No. 0801 | [B] |
| #2 Sulfolane | #2 Sulfolane Process Unit | Y | Fugitive | Process Fugitives | Existing | Component Count and Service | | | AP-42 | | | 6.85 | 6.85 | [B] |

**Table C-2 Summary of Non-Combustion Units VOC BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Emission Calculation Parameter | Baseline Period 24 Month Parameter Total | Units | Emission Factor/Method | Emission Factor Units | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #5 CDU | #5 CDU Process Unit | Y | Fugitive | Process Fugitives & Co | Existing | Component Count and Service | | | AP-42 | | | 42.06 | 22.11 | [B] |
| #6 CDU | #6 CDU Process Unit | Y | Fugitive | Process Fugitives & Co | Existing | Component Count and Service | | | AP-42 | | | 36.61 | 21.98 | [B] |
| #2 Gas Recovery Unit | Unit No. 4850 | Y | Fugitive | Process Fugitives & Compressors | Existing | Component Count and Service | | | AP-42 | | | Included with Unit No. 0801 | Included with Unit No. 0801 | [B] |
| Disulfide Handling | Unit No. 4810 | Y | Fugitive | Process Fugitives & Compressors | Existing | Component Count and Service | | | AP-42 | | | 0.29 | 0.29 | [B] |
| 1&2 LPG Treater | Unit No. 3200 | Y | Fugitive | Process Fugitives & Compressors | Existing | Component Count and Service | | | AP-42 | | | 1.99 | 1.99 | [B] |
| 3 LPG Fractionator | Unit No. 4800 | Y | Fugitive | Process Fugitives & Compressors | Existing | Component Count and Service | | | AP-42 | | | 1.99 | 1.99 | [B] |
| Light Ends Treater | Unit No. 5800 | Y | Fugitive | Process Fugitives & Compressors | Existing | Component Count and Service | | | AP-42 | | | 1.95 | 1.61 | [B] |
| #3 Platformer | #3 Platformer Process Unit | Y | Fugitive | Process Fugitives & Co | Existing | Component Count and Service | | | AP-42 | | | 40.20 | 12.16 | [B] |
| #3 VAC | #3 VAC Process Unit | Y | Fugitive | Process Fugitives | Existing | Component Count and Service | | | AP-42 | | | 27.17 | 16.74 | [B] |
| #4 Platformer | #4 Platformer Process Unit | Y | Fugitive | Process Fugitives & Co | Existing | Component Count and Service | | | AP-42 | | | 44.52 | 11.65 | [B] |
| #6 DD | #6 DD Process Unit | Y | Fugitive | Process Fugitives & Co | Existing | Component Count and Service | | | AP-42 | | | 29.75 | 11.33 | [B] |
| #7 DD | #7 DD Process Unit | Y | Fugitive | Process Fugitives & Co | Existing | Component Count and Service | | | AP-42 | | | 32.80 | 14.35 | [B] |
| #9 DD | #9 DD Process Unit | Y | Fugitive | Process Fugitives & Co | Existing | Component Count and Service | | | AP-42 | | | 30.48 | 12.11 | [B] |
| LSG Unit | LSG Unit Process Unit | Y | Fugitive | Process Fugitives & Co | Existing | Component Count and Service | | | AP-42 | | | 26.90 | 2.25 | [B] |
| #3 Platformer | #3 Plat Vent | Y | Process | Plat No. 3 Catalyst Regen Vent | Existing | Throughput | 24,054 | Mbbls | 0.0048 | lb/Mbbl | 0.06 | 0.03 | 0.03 | - |
| #4 Platformer | #4 Plat Vent | Y | Process | Plat No. 4 Catalyst Regen Vent | Existing | Throughput | 21,864 | Mbbls | 0.0048 | lb/Mbbl | 0.05 | 0.03 | 0.03 | - |
| Alkylation Unit | Unit No. 7200 | Y | Fugitive | Process Fugitives | Existing | Component Count and Service | | | AP-42 | | | 16.84 | 4.10 | [B] |
| Dimersol Unit | Unit No. 7300 | Y | Fugitive | Process Fugitives | Existing | Component Count and Service | | | AP-42 | | | 3.13 | 2.76 | [B] |

**Table C-2 Summary of Non-Combustion Units VOC BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Emission Calculation Parameter | Baseline Period 24 Month Parameter Total | Units | Emission Factor/Method | Emission Factor Units | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Deiso-Hexanizer | Deiso-Hexanizer Process Unit | Y | Fugitive | Process Fugitives | Existing | Component Count and Service | | | AP-42 | | | 0.38 | 0.36 | [B] |
| FCCU | FCCU Process Unit | Y | Fugitive | Process Fugitives & Compressors | Existing | Component Count and Service | | | AP-42 | | | 47.15 | 25.39 | [B] |
| FCCU | STK-7051 | Y | WGS | Fluid Catalytic Cracking | Existing | Exhaust Gas Flowrate | | | 9.99 | ppm (7% O2) | 57.69 | 28.85 | 28.85 | - |
| Gas Concentration | Unit No. 7100 | Y | Fugitive | Process Fugitives | Existing | Component Count and Service | | | AP-42 | | | Included with FCCU Process Unit | Included with FCCU Process Unit | [B] |
| #6 Amine | Unit No. 7450 | Y | Fugitive | Process Fugitives & Compressors | Existing | Component Count and Service | | | AP-42 | | | 0.00 | 0.00 | [B] |
| #6 Amine SHU | Unit No. 7600 | Y | Fugitive | Process Fugitives & Compressors | Existing | Component Count and Service | | | AP-42 | | | Included with Unit No. 7450 | Included with Unit No. 7450 | [B] |
| #7 Amine Unit | Unit No. 7460 | Y | Fugitive | Remove hydrogen sulfide from refinery gas and light hydrocarbons | Existing | Component Count and Service | | | AP-42 | | | 0.00 | 0.00 | [B] |
| Merox Unit | Unit No. 7500 | Y | Fugitive | Process Fugitives & Compressors | Existing | Component Count and Service | | | AP-42 | | | 0.61 | 0.58 | [B] |
| Sulfuric Acid Plant | STK-7802 | Y | Process | Process Stack | Existing | | | | | | | 0.00 | 0.00 | - |
| MTBE | MTBE | Y | Fugitive | Process Fugitives | Existing | Component Count and Service | | | | | | 0.82 | 0.82 | [B] |
| TAME | TAME | Y | Fugitive | Process Fugitives | Existing | Component Count and Service | | | | | | 1.48 | 1.48 | [B] |
| Selective Hydro | Selective Hydro | Y | Fugitive | Process Fugitives | Existing | Component Count and Service | | | | | | 2.86 | 2.43 | [B] |
| #1 SRU | Unit No. 1030 | Y | Fugitive | Sulfur Recovery Units | Existing | Component Count and Service | | | AP-42 | | | 0.18 | 0.17 | [B] |
| #2 SRU | Unit No. 1040 | Y | Fugitive | Sulfur Recovery Units | Existing | Component Count and Service | | | AP-42 | | | Included with Unit No. 1030 | Included with Unit No. 1030 | [B] |
| #3 SRU | Unit No. 4740 | Y | Fugitive | Sulfur Recovery Units | Existing | Component Count and Service | | | AP-42 | | | 1.84 | 1.43 | [B] |
| #4 SRU | Unit No. 4750 | Y | Fugitive | Sulfur Recovery Units | Existing | Component Count and Service | | | AP-42 | | | Included with Unit No. 4740 | Included with Unit No. 4740 | [B] |
| SRU | SRU | Y | Fugitive | | Existing | Component Count and Service | | | AP-42 | | | 0.00 | 0.00 | [B] |
| 3 SWS | 3 SWS | Y | Fugitive | | Existing | Component Count and Service | | | AP-42 | | | 0.00 | 0.00 | [B] |

**Table C-2 Summary of Non-Combustion Units VOC BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Emission Calculation Parameter | Baseline Period 24 Month Parameter Total | Units | Emission Factor/Method | Emission Factor Units | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 SWS | 4 SWS | Y | Fugitive | | Existing | Component Count and Service | | | AP-42 | | | 0.00 | 0.00 | [B] |
| 5 SWS | 5 SWS | Y | Fugitive | | Existing | Component Count and Service | | | AP-42 | | | 0.00 | 0.00 | [B] |
| 6 SWS | 6 SWS | Y | Fugitive | | Existing | Component Count and Service | | | AP-42 | | | 0.01 | 0.01 | [B] |
| West Refinery Process Drains | Oily Water Collection System | Y | Fugitive | Process Drain Fugitives | Existing | Component Count and Service | | | AP-42 | | | 15.85 | 15.85 | [B] |
| East Refinery Process Drains | Oily Water Collection System | Y | Fugitive | Process Drain Fugitives | Existing | Component Count and Service | | | AP-42 | | | 28.28 | 28.28 | [B] |
| FCC Complex / Delayed Coker Unit | Oily Water Collection System | Y | Fugitive | Process Drain Fugitives | Existing | Component Count and Service | | | AP-42 | | | 15.58 | 15.58 | [B] |
| Terminal | Oily Water Collection System | Y | Fugitive | Process Drain Fugitives | Existing | Component Count and Service | | | AP-42 | | | 4.14 | 4.14 | [B] |
| Advanced Wastewater Treatment System | #1 API (Unit No. 1660) | Y | WWTP | Oil/Water Separator | Existing | | | | | | | 43.07 | 43.07 | - |
| Advanced Wastewater Treatment System | #1 WEMCO | Y | WWTP | Induced Air Floatation Unit | Existing | | | | | | | 42.00 | 42.00 | - |
| Advanced Wastewater Treatment System | #1 Lagoon | Y | WWTP | Aerated Lagoon | Existing | | | | | | | 0.00 | 0.00 | - |
| Advanced Wastewater Treatment System | #2 API (Unit No. 1661) | Y | WWTP | Oil/Water Separator | Existing | | | | | | | 31.70 | 31.70 | - |
| Advanced Wastewater Treatment System | #2 WEMCO | Y | WWTP | Induced air floatation unit | Existing | | | | | | | 31.25 | 31.25 | - |
| Advanced Wastewater | #2 Lagoon | Y | WWTP | Aerated lagoon | Existing | | | | | | | 0.00 | 0.00 | - |
| Advanced Wastewater Treatment System | West Benzene Stripper (STK-3510) | Y | WWTP | Air Stripper | Existing | | | | | | | 1.15 | 1.15 | - |
| Advanced Wastewater Treatment System | #3 API (Unit No. 1662) | Y | WWTP | Oil/Water Separator | Existing | | | | | | | 91.24 | 91.24 | - |
| Advanced Wastewater Treatment System | #3 WEMCO | Y | WWTP | Induced air floatation unit | Existing | | | | | | | 89.96 | 89.96 | - |
| Advanced Wastewater Treatment System | #3 Lagoon | Y | WWTP | Aerated lagoon | Existing | | | | | | | 0.00 | 0.00 | - |

**Table C-2 Summary of Non-Combustion Units VOC BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Emission Calculation Parameter | Baseline Period 24 Month Parameter Total | Units | Emission Factor/Method | Emission Factor Units | Baseline Period 24 Month Total Emission s (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Advanced Wastewater Treatment System | East Benzene Stripper (STK-3530) | Y | WWTP | Air Stripper | Existing | | | | | | | 0.00 | 0.00 | - |
| Advanced Wastewater Treatment System | #3 & 4 Sour Water Strippers (Unit No. 4720/30 | Y | WWTP | Steam Stripper | Existing | | | | | | | 0.00 | 0.00 | - |
| Advanced Wastewater Treatment System | #5 Sour Water Stripper (Unit No. 7400 | Y | WWTP | Steam Stripper | Existing | | | | | | | 0.00 | 0.00 | - |
| Advanced Wastewater Treatment System | #6 Sour Water Stripper | Y | WWTP | Steam Stripper | Existing | | | | | | | 0.00 | 0.00 | - |
| Advanced Wastewater Treatment System | CPS Oil/Water Separator | Y | WWTP | Oil/Water Separator | Existing | | | | | | | 0.00 | 0.00 | - |
| Refinery Flare System | #2 Flare (H-1105) | Y | Flare | Gas burner | Existing | Heat Release | 2,093 | MMSCF | Molar Composition | | 363.79 | 181.89 | 181.89 | - |
| Refinery Flare System | #3 Flare (H-1104) | Y | Flare | Gas burner | Existing | Heat Release | 2,053 | MMSCF | Molar Composition | | 356.84 | 178.42 | 178.42 | - |
| Refinery Flare System | #5 Flare (H-3351) | Y | Flare | Gas burner | Existing | Heat Release | 1,683 | MMSCF | Molar Composition | | 811.80 | 405.90 | 405.90 | - |
| Refinery Flare System | #6 Flare (H-3352) | Y | Flare | Gas burner | Existing | Heat Release | 739 | MMSCF | Molar Composition | | 458.34 | 229.17 | 229.17 | - |
| Refinery Flare System | #7 Flare (H-3301) | Y | Flare | Gas burner | Existing | Heat Release | 2,206 | MMSCF | Molar Composition | | 1532.64 | 766.32 | 766.32 | - |
| Refinery Flare System | LPG Flare (STK 7921) | Y | Flare | Gas burner, steam assisted | Existing | Heat Release | 0 | MMSCF | Molar Composition | | 0.00 | | | |
| Refinery Flare System | FCC Flare (L.P. Flare - STK 7941) | Y | Flare | Gas burner, steam assisted | Existing | Heat Release | 1,558 | MMSCF | Molar Composition | | 918.29 | 459.15 | 459.15 | - |
| Refinery Flare System | Ground Flare (H.P. Flare - STK 7942) | Y | Flare | Gas burner | Existing | Heat Release | 334 | MMSCF | Molar Composition | | 197.01 | 98.51 | 98.51 | - |
| Delayed Coker Unit | Delayed Coker Unit Process Unit | Y | Fugitive | Process Fugitives & C | Existing | Component Count and Service | | | AP-42 | | | 26.52 | 25.34 | [B] |
| Delayed Coker Unit | TK-8501 | Y | Tank Fug | Fixed roof storage tank (pitch) | Existing | | | | | | | 3.45 | 3.45 | [D] |
| Coker Complex | TK-8511 | Y | Tank | Tank TK-8511 and recycling system | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Coker Complex | Delayed Coker Steam Vent | Y | Process | Delayed Coker Steam Vent | Existing | Coker Drum Vent Episodes | 1,442 | Episodes | 178 | lbs/episode | 128.34 | 64.17 | 49.89 | [C] |
| Tank | TK-1071 | Y | Tank | External Floating Roof | Existing | | | | | | | 0.66 | 0.66 | [D] |
| Tank | TK-1151 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-1156 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-1157 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-1201 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.01 | 0.01 | [D] |
| Tank | TK-1202 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.01 | 0.01 | [D] |
| Tank | TK-1203 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.01 | 0.01 | [D] |
| Tank | TK-1206 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-1207 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |

**Table C-2 Summary of Non-Combustion Units VOC BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Emission Calculation Parameter | Baseline Period 24 Month Parameter Total | Units | Emission Factor/Method | Emission Factor Units | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tank | TK-1208 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-1302 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-1626 | Y | Tank | Horizontal | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-1627 | Y | Tank | Horizontal | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-1628 | Y | Tank | Horizontal | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-1629 | Y | Tank | Horizontal | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-1630 | Y | Tank | Horizontal | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-1631 | Y | Tank | Horizontal | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-1632 | Y | Tank | Horizontal | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-1633 | Y | Tank | Horizontal | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-1653 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.01 | 0.01 | [D] |
| Tank | TK-1663 | Y | Tank | External Floating Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-2653 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.01 | 0.01 | [D] |
| Tank | TK-2654 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.05 | 0.05 | [D] |
| Tank | TK-3208 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-3301 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-3302 | Y | Tank | Geodesic Dome | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-3304 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.73 | 0.73 | [D] |
| Tank | TK-3306 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.42 | 0.42 | [D] |
| Tank | TK-3384 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-3385 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.34 | 0.34 | [D] |
| Tank | TK-3386 | Y | Tank | Fixed Roof | Existing | | | | | | | 10.42 | 10.42 | [D] |
| Tank | TK-4501 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.90 | 0.90 | [D] |
| Tank | TK-4502 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-4503 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-4725 | Y | Tank | External Floating Roof | Existing | | | | | | | 0.51 | 0.51 | [D] |
| Tank | TK-4726 | Y | Tank | External Floating Roof | Existing | | | | | | | 2.80 | 2.80 | [D] |
| Tank | TK-6801 | Y | Tank | External Floating Roof | Existing | | | | | | | 1.14 | 1.14 | [D] |
| Tank | TK-6802 | Y | Tank | External Floating Roof | Existing | | | | | | | 1.60 | 1.60 | [D] |
| Tank | TK-6803 | Y | Tank | External Floating | Existing | | | | | | | 2.29 | 2.29 | [D] |
| Tank | TK-6804 | Y | Tank | External Floating Roof | Existing | | | | | | | 3.63 | 3.63 | [D] |
| Tank | TK-6805 | Y | Tank | External Floating Roof | Existing | | | | | | | 3.00 | 3.00 | [D] |
| Tank | TK-6806 | Y | Tank | External Floating Roof | Existing | | | | | | | 3.18 | 3.18 | [D] |
| Tank | TK-6807 | Y | Tank | External Floating Roof | Existing | | | | | | | 1.31 | 1.31 | [D] |
| Tank | TK-6808 | Y | Tank | External Floating Roof | Existing | | | | | | | 0.64 | 0.64 | [D] |
| Tank | TK-6809 | Y | Tank | External Floating Roof | Existing | | | | | | | 4.14 | 4.14 | [D] |
| Tank | TK-6810 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-6811 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.03 | 0.03 | [D] |
| Tank | TK-6812 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.02 | 0.02 | [D] |
| Tank | TK-6813 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-6814 | Y | Tank | External Floating Roof | Existing | | | | | | | 0.05 | 0.05 | [D] |
| Tank | TK-6815 | Y | Tank | External Floating Roof | Existing | | | | | | | 3.39 | 3.39 | [D] |
| Tank | TK-6816 | Y | Tank | External Floating Roof | Existing | | | | | | | 2.73 | 2.73 | [D] |
| Tank | TK-6817 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.06 | 0.06 | [D] |
| Tank | TK-6818 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.05 | 0.05 | [D] |
| Tank | TK-6819 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-6820 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-6821 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.95 | 0.95 | [D] |
| Tank | TK-6822 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.01 | 0.01 | [D] |
| Tank | TK-6823 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-6824 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-6825 | Y | Tank | Fixed Roof | Existing | | | | | | | 8.38 | 8.38 | [D] |
| Tank | TK-6831 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 6.47 | 6.47 | [D] |

Table C-2  Summary of Non-Combustion Units VOC BAE

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Emission Calculation Parameter | Baseline Period 24 Month Parameter Total | Units | Emission Factor/Method | Emission Factor Units | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tank | TK-6832 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 5.83 | 5.83 | [D] |
| Tank | TK-6833 | Y | Tank | External Floating Roof | Existing | | | | | | | 2.62 | 2.62 | [D] |
| Tank | TK-6834 | Y | Tank | External Floating Roof | Existing | | | | | | | 1.80 | 1.80 | [D] |
| Tank | TK-6835 | Y | Tank | External Floating Roof | Existing | | | | | | | 1.76 | 1.76 | [D] |
| Tank | TK-6836 | Y | Tank | External Floating Roof | Existing | | | | | | | 4.30 | 4.30 | [D] |
| Tank | TK-6837 | Y | Tank | External Floating Roof | Existing | | | | | | | 3.76 | 3.76 | [D] |
| Tank | TK-6838 | Y | Tank | External Floating Roof | Existing | | | | | | | 6.39 | 6.39 | [D] |
| Tank | TK-6839 | Y | Tank | External Floating Roof | Existing | | | | | | | 8.09 | 8.09 | [D] |
| Tank | TK-6840 | Y | Tank | External Floating Roof | Existing | | | | | | | 2.56 | 2.56 | [D] |
| Tank | TK-6841 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 4.13 | 4.13 | [D] |
| Tank | TK-6842 | Y | Tank | External Floating Roof | Existing | | | | | | | 1.70 | 1.70 | [D] |
| Tank | TK-6843 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 1.68 | 1.68 | [D] |
| Tank | TK-6851 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.26 | 0.26 | [D] |
| Tank | TK-6852 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.11 | 0.11 | [D] |
| Tank | TK-6853 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-6854 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.47 | 0.47 | [D] |
| Tank | TK-6856 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-6858 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-6871 | Y | Tank | Fixed Roof with Carbon Canisters | Existing | | | | | | | 6.73 | 6.73 | [D] |
| Tank | TK-6872 | Y | Tank | Fixed Roof with Carbon Canisters | Existing | | | | | | | 6.13 | 6.13 | [D] |
| Tank | TK-6873 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-6874 | Y | Tank | Fixed Roof with Carbon Canisters | Existing | | | | | | | 10.44 | 10.44 | [D] |
| Tank | TK-6875 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-6876 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-6877 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.01 | 0.01 | [D] |
| Tank | TK-6881 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-6883 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.09 | 0.09 | [D] |
| Tank | TK-6884 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 3.56 | 3.56 | [D] |
| Tank | TK-6887 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.10 | 0.10 | [D] |
| Tank | TK-6888 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 26.50 | 26.50 | [D] |
| Tank | TK-700 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-701 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-702 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-7206 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-7207 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-7208 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-7209 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-7210 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-7211 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-7401 | Y | Tank | External Floating Roof | Existing | | | | | | | 5.85 | 5.85 | [D] |
| Tank | TK-7402 | Y | Tank | External Floating Roof | Existing | | | | | | | 2.77 | 2.77 | [D] |
| Tank | TK-7403 | Y | Tank | External Floating Roof | Existing | | | | | | | 19.69 | 19.69 | [D] |
| Tank | TK-7404 | Y | Tank | External Floating Roof | Existing | | | | | | | 5.82 | 5.82 | [D] |
| Tank | TK-7405 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.19 | 0.19 | [D] |
| Tank | TK-7406 | Y | Tank | Fixed Roof | Existing | | | | | | | 2.53 | 2.53 | [D] |
| Tank | TK-7407 | Y | Tank | External Floating Roof | Existing | | | | | | | 2.47 | 2.47 | [D] |
| Tank | TK-7408 | Y | Tank | External Floating Roof | Existing | | | | | | | 7.64 | 7.64 | [D] |
| Tank | TK-7409 | Y | Tank | External Floating Roof | Existing | | | | | | | 16.25 | 16.25 | [D] |
| Tank | TK-7410 | Y | Tank | External Floating Roof | Existing | | | | | | | 5.00 | 5.00 | [D] |
| Tank | TK-7411 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |

**Table C-2 Summary of Non-Combustion Units VOC BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Emission Calculation Parameter | Baseline Period 24 Month Parameter Total | Units | Emission Factor/Method | Emission Factor Units | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tank | TK-7412 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-7413 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.18 | 0.18 | [D] |
| Tank | TK-7414 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-7415 | Y | Tank | Fixed Roof | Existing | | | | | | | 2.95 | 2.95 | [D] |
| Tank | TK-7416 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.05 | 0.05 | [D] |
| Tank | TK-7417 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 13.25 | 13.25 | [D] |
| Tank | TK-7418 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 17.51 | 17.51 | [D] |
| Tank | TK-7421 | Y | Tank | Fixed Roof | Existing | | | | | | | 8.64 | 8.64 | [D] |
| Tank | TK-7422 | Y | Tank | Fixed Roof | Existing | | | | | | | 9.86 | 9.86 | [D] |
| Tank | TK-7423 | Y | Tank | External Floating Roof | Existing | | | | | | | 7.44 | 7.44 | [D] |
| Tank | TK-7424 | Y | Tank | External Floating Roof | Existing | | | | | | | 24.58 | 24.58 | [D] |
| Tank | TK-7425 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 94.38 | 92.62 | [D] |
| Tank | TK-7426 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 117.75 | 115.97 | [D] |
| Tank | TK-7427 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.26 | 0.26 | [D] |
| Tank | TK-7428 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.12 | 0.12 | [D] |
| Tank | TK-7429 | Y | Tank | Fixed Roof | Existing | | | | | | | 14.15 | 14.15 | [D] |
| Tank | TK-7430 | Y | Tank | Fixed Roof | Existing | | | | | | | 12.64 | 12.64 | [D] |
| Tank | TK-7431 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.10 | 0.10 | [D] |
| Tank | TK-7432 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.07 | 0.07 | [D] |
| Tank | TK-7433 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-7434 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.02 | 0.02 | [D] |
| Tank | TK-7435 | Y | Tank | Fixed Roof | Existing | | | | | | | 5.18 | 5.18 | [D] |
| Tank | TK-7436 | Y | Tank | Fixed Roof | Existing | | | | | | | 5.27 | 5.27 | [D] |
| Tank | TK-7437 | Y | Tank | Fixed Roof | Existing | | | | | | | 4.55 | 4.55 | [D] |
| Tank | TK-7438 | Y | Tank | Fixed Roof | Existing | | | | | | | 3.64 | 3.64 | [D] |
| Tank | TK-7439 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.01 | 0.01 | [D] |
| Tank | TK-7440 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-7441 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.76 | 0.76 | [D] |
| Tank | TK-7443 | Y | Tank | External Floating | Existing | | | | | | | 32.31 | 32.31 | [D] |
| Tank | TK-7444 | Y | Tank | External Floating Roof | Existing | | | | | | | 13.45 | 13.45 | [D] |
| Tank | TK-7445 | Y | Tank | External Floating Roof | Existing | | | | | | | 13.25 | 13.25 | [D] |
| Tank | TK-7446 | Y | Tank | Fixed Roof | Existing | | | | | | | 32.11 | 32.11 | [D] |
| Tank | TK-7447 | Y | Tank | External Floating Roof | Existing | | | | | | | 8.32 | 7.99 | [D] |
| Tank | TK-7448 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 8.48 | 8.48 | [D] |
| Tank | TK-7449 | Y | Tank | External Floating Roof | Existing | | | | | | | 19.93 | 19.93 | [D] |
| Tank | TK-7451 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.07 | 0.07 | [D] |
| Tank | TK-7452 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.05 | 0.05 | [D] |
| Tank | TK-7453 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.05 | 0.05 | [D] |
| Tank | TK-7454 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.03 | 0.03 | [D] |
| Tank | TK-7455 | Y | Tank | External Floating Roof | Existing | | | | | | | 0.06 | 0.06 | [D] |
| Tank | TK-7456 | Y | Tank | External Floating Roof | Existing | | | | | | | 0.06 | 0.06 | [D] |
| Tank | TK-7501 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.05 | 0.05 | [D] |
| Tank | TK-7502 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.52 | 0.52 | [D] |
| Tank | TK-7503 | Y | Tank | Fixed Roof | Existing | | | | | | | 7.48 | 7.48 | [D] |
| Tank | TK-7504 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.05 | 0.05 | [D] |
| Tank | TK-7505 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.10 | 0.10 | [D] |
| Tank | TK-7506 | Y | Tank | Fixed Roof | Existing | | | | | | | 2.54 | 2.54 | [D] |
| Tank | TK-7507 | Y | Tank | External Floating Roof | Existing | | | | | | | 5.76 | 5.76 | [D] |
| Tank | TK-7508 | Y | Tank | External Floating Roof | Existing | | | | | | | 2.67 | 2.67 | [D] |
| Tank | TK-7509 | Y | Tank | External Floating Roof | Existing | | | | | | | 3.32 | 3.32 | [D] |
| Tank | TK-7510 | Y | Tank | External Floating Roof | Existing | | | | | | | 2.20 | 2.20 | [D] |
| Tank | TK-7511 | Y | Tank | External Floating Roof | Existing | | | | | | | 5.28 | 5.28 | [D] |
| Tank | TK-7512 | Y | Tank | External Floating Roof | Existing | | | | | | | 3.92 | 3.92 | [D] |

**Table C-2 Summary of Non-Combustion Units VOC BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Emission Calculation Parameter | Baseline Period 24 Month Parameter Total | Units | Emission Factor/Method | Emission Factor Units | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tank | TK-7513 | Y | Tank | External Floating Roof | Existing | | | | | | | 2.89 | 2.89 | [D] |
| Tank | TK-7514 | Y | Tank | External Floating Roof | Existing | | | | | | | 4.79 | 4.79 | [D] |
| Tank | TK-7515 | Y | Tank | External Floating Roof | Existing | | | | | | | 6.59 | 6.59 | [D] |
| Tank | TK-7516 | Y | Tank | External Floating Roof | Existing | | | | | | | 10.94 | 10.94 | [D] |
| Tank | TK-7517 | Y | Tank | External Floating Roof | Existing | | | | | | | 4.42 | 4.42 | [D] |
| Tank | TK-7521 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.13 | 0.13 | [D] |
| Tank | TK-7522 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.04 | 0.04 | [D] |
| Tank | TK-7523 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.03 | 0.03 | [D] |
| Tank | TK-7524 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.05 | 0.05 | [D] |
| Tank | TK-7525 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.03 | 0.03 | [D] |
| Tank | TK-7526 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.04 | 0.04 | [D] |
| Tank | TK-7528 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 3.27 | 3.27 | [D] |
| Tank | TK-7601 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.16 | 0.16 | [D] |
| Tank | TK-7602 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.07 | 0.07 | [D] |
| Tank | TK-7603 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.11 | 0.11 | [D] |
| Tank | TK-7604 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.32 | 0.32 | [D] |
| Tank | TK-7605 | Y | Tank | External Floating Roof | Existing | | | | | | | 0.41 | 0.41 | [D] |
| Tank | TK-7933 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-7934 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-7974 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | D-1301 | Y | Tank | Horizontal | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | D-1609 | Y | Tank | Horizontal | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | D-1610 | Y | Tank | Horizontal | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | D-1620 | Y | Tank | UST / Horizontal | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-8001 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-8002 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | PRT1 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.35 | 0.35 | [D] |
| Tank | PRT2 | Y | Tank | Internal Floating Roof | Existing | | | | | | | 0.66 | 0.66 | [D] |
| Tank | PRT3 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | PRT4 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | PRT5 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | PRT6 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | PRT7 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-6860 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-6859 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | S-7974 | Y | Tank | External Floating | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | S-7975 | Y | Tank | External Floating Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | UTT1 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-1118 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-1204 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.02 | 0.02 | [D] |
| Tank | TK-1205 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-1600 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-3201 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-3202 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-3204 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-3208 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-3209 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-7201 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-7301 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-7302 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-7542 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-7571 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Tank | TK-7943 | Y | Tank | Fixed Roof | Existing | | | | | | | 0.00 | 0.00 | [D] |

## Table C-2 Summary of Non-Combustion Units VOC BAE

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Emission Calculation Parameter | Baseline Period 24 Month Parameter Total | Units | Emission Factor/Method | Emission Factor Units | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tank | D-290 | Y | Tank | Horizontal | Existing | | | | | | | 0.00 | 0.00 | [D] |
| Marine Loading (Docks 1 thru 9 and Dry Cargo Dock) | Unit No. 1600 | Y | Fugitive | Ship loading and unloading | Existing | Gasoline Shipments | 101,049,359 | bbls | AP-42 | | 3,918 | 1959.07 | 1921.34 | [A1] |
| Truck loading rack | Unit No. 1651 | Y | Fugitive | Dispense liquid and gaseous fuel to tank trucks | Existing | Local Sales and Intraplant Consumption | 2,355,102 | bbls | AP-42 | | | 5.23 | 5.23 | [E] |
| Fuel pumps | Gasoline Service Station | Y | Fugitive | Dispense gasoline and diesel | Existing | Intraplant Consumption | | | AP-42 | | 35.49 | 17.75 | 17.75 | [F] |
| Terminal | Terminal | Y | Fugitive | Process Fugitives | Existing | Component Count and Service | | | AP-42 | | | 156.22 | 125.53 | [B] |
| Utilities (Powerhouse and Boilers) | Utilities (Powerhouse and Boilers) | Y | Fugitive | Process Fugitives | Existing | Component Count and Service | | | AP-42 | | | 7.75 | 7.27 | [B] |
| East Fuel Gas System | Unit No. 1902 | Y | Fugitive | East/West fuel gas system | Existing | Component Count and Service | | | AP-42 | | | 14.23 | 14.08 | [B] |
| West Fuel Gas System | Unit No. 3303 | Y | Fugitive | East/West fuel gas system | Existing | Component Count and Service | | | AP-42 | | | 14.14 | 14.00 | [B] |
| Painting | Paint | Y | Fugitive | Paint | Existing | | | | | | | 8.40 | 8.40 | - |
| Fire Training | Fire Training | Y | Flare | Fire Training | Existing | Fuel Usage | 48,778 | lbs | 0.32 | lb/lb fuel | 7.8 | 3.90 | 3.90 | - |
| | | | | | | | | | | | Total tpy | 6,483 | 6,006 | |

Notes: "-" indicates no adjustments to the BAE were required.

[A] [RESERVED]

[A1] Per Condition B.1(a)(ii) of Marine Loading Project ATC (STX-895-AC-PO-18-2), until the previously constructed MVCS is repaired or replaced, use of the MVCS is not required provided the total VOC emissions do not exceed 2,000 tpy on a 12-month rolling basis. Per 40 CFR 52.21 (aa)(2)(xiii)(c), the BAE must be adjusted downward to exclude any emissions that would have exceeded an emissions limitation with which the source must currently comply. To conservatively address this requirement, emissions in excess of 2,000 tpy for each calendar year were reset to the limit prior to averaging for the BAE.

[B] Fugitive VOC emissions from equipment leaks based on EPA "Protocol for Equipment Leak Emission Estimates" (EPA-453/R-95-017, November 1995) and the TCEQ "Air Permit Technical Guidance for Chemical Sources - Fugitive Guidance" (TCEQ-APDG 6422v2, Revised 06/18). A limited number of equipment were reported as not monitored but are currently required to be monitored. Emissions were downwardly adjusted using the applicable reduction credit based on the TCEQ proposed monitoring control efficiency for the 28 VHP LDAR Program.

[C] VOC BAE from the delayed coker vent were downwardly adjusted to comply with 2 psig depressurization standard in Consent Decree.

[D] VOC emissions from tanks estimated using the methodology in AP-42, Chapter 7.1. Tanks listed in the application and not listed in this appendix did not contribute VOC emissions during the baseline period.

[E] Loading losses based on AP-42,Chapter 5.2

[F] Loading losses based on AP-42,Chapter 5.2

[G] Emission factors for fire traing (JP-4) per "Calculation Methods for Criteria Air Pollutant Emission Inventories", Brooks Air Force Base, TX, July 1994

**Table C-3 Summary of Combustion Units CO BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #2 DU Fractionator | H-101 | Y | Heater/Boiler | Heater | Existing | 146 | 791,295 | 43,469 | Emission Factor | 8.24E-02 | 3.38E-02 | 33.32 | 16.66 | 16.66 | - |
| #2 DU Fractionator | H-104 | Y | Heater/Boiler | Heater | Existing | 108 | 654,318 | 40,043 | Emission Factor | 8.24E-02 | 3.38E-02 | 27.62 | 13.81 | 13.81 | - |
| #2 CDU | H-401A | Y | Heater/Boiler | Charge Heater | Existing | 171 | 828,797 | 257,804 | Emission Factor | 8.24E-02 | 3.38E-02 | 38.48 | 19.24 | 19.24 | - |
| #2 CDU | H-401B | Y | Heater/Boiler | Charge Heater | Existing | 171 | 828,797 | 257,804 | Emission Factor | 8.24E-02 | 3.38E-02 | 38.48 | 19.24 | 19.24 | - |
| #2 CDU | H-401C | Y | Heater/Boiler | Charge Heater | Existing | 171 | 828,797 | 257,804 | Emission Factor | 8.24E-02 | 3.38E-02 | 38.48 | 19.24 | 19.24 | - |
| #3 DD | C-1500A | Y | Compressor | Reciprocating Gas Compressor | Existing | 3 | 15,104 | 0 | Emission Factor | 3.72E+00 | | 28.09 | 14.05 | 14.05 | - |
| #3 DD | C-1500B | Y | Compressor | Reciprocating Gas Compressor | Existing | 3 | 15,104 | 0 | Emission Factor | 3.72E+00 | | 28.09 | 14.05 | 14.05 | - |
| #3 DD | C-1500C | Y | Compressor | Reciprocating Gas Compressor | Existing | 3 | 15,104 | 0 | Emission Factor | 3.72E+00 | | 28.09 | 14.05 | 14.05 | - |
| Penex | H-200 | Y | Heater/Boiler | Charge Heater | Existing | 37 | 389,579 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 16.04 | 8.02 | 8.02 | - |
| Penex | H-201 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 37 | 395,352 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 16.28 | 8.14 | 8.14 | - |
| Penex | H-202 | Y | Heater/Boiler | Hot Oil Heater | Existing | 122 | 874,691 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 36.02 | 18.01 | 18.01 | - |
| Penex | C-200A | Y | Compressor | Reciprocating Gas Compressor | Existing | 9 | 75,121 | 0 | Emission Factor | 1.67E+00 | | 59.34 | 29.67 | 29.67 | [A] |
| Penex | C-200B | Y | Compressor | Reciprocating Gas Compressor | Existing | 9 | 75,121 | 0 | Emission Factor | 1.70E+00 | | 63.10 | 31.55 | 31.55 | [A] |
| Penex | C-200C | Y | Compressor | Reciprocating Gas Compressor | Existing | 9 | 75,121 | 0 | Emission Factor | 1.03E+00 | | 33.39 | 16.70 | 16.70 | [A] |
| Utility Fractionation | H-160 | Y | Heater/Boiler | Charge Heater | Existing | 135 | 884,143 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 36.41 | 18.20 | 18.20 | - |
| #2 Platformer | H-601 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 36 | 221,021 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 9.10 | 4.55 | 4.55 | - |
| #2 Platformer | H-604 | Y | Heater/Boiler | Platforming No. 2 Interheater | Existing | 37 | 214,990 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 8.85 | 4.43 | 4.43 | - |
| #2 Platformer | H-605 | Y | Heater/Boiler | Platforming No. 3 Interheater | Existing | 15 | 59,776 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 2.46 | 1.23 | 1.23 | - |
| #2 DU | H-800A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 43 | 461,566 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 19.01 | 9.50 | 9.50 | - |
| #2 DU | H-800B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 43 | 441,880 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 18.20 | 9.10 | 9.10 | - |
| #2 DU | H-801 | Y | Heater/Boiler | Stripper Heater | Existing | 101 | 803,114 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 33.07 | 16.53 | 16.53 | - |
| #4 DD | H-2201A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 61 | 690,666 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 28.44 | 14.22 | 14.22 | - |
| #4 DD | H-2201B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 61 | 690,666 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 28.44 | 14.22 | 14.22 | - |
| #4 DD | H-2202 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 119 | 980,002 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 40.35 | 20.18 | 20.18 | - |
| #5 DD | H-2400 | Y | Heater/Boiler | Charge Heater | Existing | 33 | 463,511 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 19.09 | 9.54 | 9.54 | - |
| #5 DD | C-2400A | Y | Compressor | Reciprocating Gas Compressor | Existing | 7 | 48,723 | 0 | Emission Factor | 1.39E+00 | | 32.32 | 16.16 | 16.16 | [A] |
| #5 DD | C-2400B | Y | Compressor | Reciprocating Gas Compressor | Existing | 7 | 48,723 | 0 | Emission Factor | 9.45E-01 | | 25.18 | 12.59 | 12.59 | [A] |
| Naphtha Fractionation | H-2501 | Y | Heater/Boiler | Reboiler Heater | Existing | 203 | 437,565 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 18.02 | 9.01 | 9.01 | - |
| #2 Sulfolane | H-4502 | Y | Heater/Boiler | Benzene Column Reboiler Heater | Existing | 149 | 858,943 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 35.37 | 17.68 | 17.68 | - |
| #2 Sulfolane | H-4503 | Y | Heater/Boiler | Toluene Column Reboiler Heater | Existing | 141 | 753,962 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 31.05 | 15.52 | 15.52 | - |

## Table C-3 Summary of Combustion Units CO BAE

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emission s (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #2 Sulfolane | H-4504 | Y | Heater/Boiler | Xylene Column Reboiler Heater | Existing | 126 | 607,009 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 24.99 | 12.50 | 12.50 | - |
| #2 Sulfolane | H-4505 | Y | Heater/Boiler | Raffinate Splitter Reboiler Heater | Existing | 109 | 470,895 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 19.39 | 9.69 | 9.69 | - |
| #5 CDU | H-3101A | Y | Heater/Boiler | Crude Charge Heater | Existing | 381 | 2,184,815 | 614,217 | Emission Factor | 8.24E-02 | 3.38E-02 | 100.34 | 50.17 | 50.17 | - |
| #5 CDU | H-3101B | Y | Heater/Boiler | Crude Charge Heater | Existing | 381 | 2,436,185 | 659,430 | Emission Factor | 8.24E-02 | 3.38E-02 | 111.45 | 55.73 | 55.73 | - |
| #6 CDU | H-4101A | Y | Heater/Boiler | Crude Charge Heater | Existing | 381 | 2,446,267 | 516,409 | Emission Factor | 8.24E-02 | 3.38E-02 | 109.45 | 54.73 | 54.73 | - |
| #6 CDU | H-4101B | Y | Heater/Boiler | Crude Charge Heater | Existing | 381 | 2,817,416 | 557,900 | Emission Factor | 8.24E-02 | 3.38E-02 | 125.44 | 62.72 | 62.72 | - |
| #3 Platformer | H-4401 | Y | Heater/Boiler | Charge Heater | Existing | 134 | 1,025,393 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 42.22 | 21.11 | 21.11 | - |
| #3 Platformer | H-4402 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 128 | 721,833 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 29.72 | 14.86 | 14.86 | - |
| #3 Platformer | H-4451 | Y | Heater/Boiler | Charge Heater | Existing | 381 | 2,918,945 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 120.19 | 60.10 | 60.10 | - |
| #3 Platformer | H-4452 | Y | Heater/Boiler | Intermediate Heater | Existing | 248 | 1,803,863 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 74.28 | 37.14 | 37.14 | - |
| #3 Platformer | H-4453 | Y | Heater/Boiler | Intermediate Heater | Existing | 248 | 1,338,392 | 0 | Emission Factor | 8.24E-02 | | 55.11 | 27.56 | 27.56 | |
| #3 Platformer | H-4454 | Y | Heater/Boiler | Intermediate Heater | Existing | 77 | 518,276 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 21.34 | 10.67 | 10.67 | - |
| #3 Platformer | H-4455 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 138 | 1,076,287 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 44.32 | 22.16 | 22.16 | - |
| #3 VAC | H-4201 | Y | Heater/Boiler | Prestripper Heater | Existing | 253 | 1,195,811 | 545,534 | Emission Factor | 8.24E-02 | 3.38E-02 | 58.45 | 29.23 | 29.23 | - |
| #3 VAC | H-4202 | Y | Heater/Boiler | Vacuum Heater | Existing | 245 | 962,882 | 553,169 | Emission Factor | 8.24E-02 | 3.38E-02 | 48.99 | 24.50 | 24.50 | - |
| #4 Platformer | H-5401 | Y | Heater/Boiler | Charge Heater | Existing | 134 | 983,723 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 40.51 | 20.25 | 20.25 | - |
| #4 Platformer | H-5402 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 128 | 684,930 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 28.20 | 14.10 | 14.10 | - |
| #4 Platformer | H-5451 | Y | Heater/Boiler | Charge Heater | Existing | 381 | 2,059,984 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 84.82 | 42.41 | 42.41 | - |
| #4 Platformer | H-5452 | Y | Heater/Boiler | Intermediate Heater | Existing | 248 | 1,843,813 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 75.92 | 37.96 | 37.96 | - |
| #4 Platformer | H-5453 | Y | Heater/Boiler | Intermediate Heater | Existing | 248 | 1,356,092 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 55.84 | 27.92 | 27.92 | - |
| #4 Platformer | H-5454 | Y | Heater/Boiler | Intermediate Heater | Existing | 77 | 491,861 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 20.25 | 10.13 | 10.13 | - |
| #4 Platformer | H-5455 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 138 | 1,014,968 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 41.79 | 20.90 | 20.90 | - |
| #6 DD | H-4601A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 61 | 307,355 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 12.66 | 6.33 | 6.33 | - |
| #6 DD | H-4601B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 61 | 306,150 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 12.61 | 6.30 | 6.30 | - |
| #6 DD | H-4602 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 119 | 669,854 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 27.58 | 13.79 | 13.79 | - |
| #6 DD | C-4601A | Y | Compressor | Reciprocating Gas Compressor | Existing | 21 | 86,488 | 0 | Emission Factor | 5.57E-01 | | 24.09 | 12.04 | 12.04 | - |
| #6 DD | C-4601B | Y | Compressor | Reciprocating Gas Compressor | Existing | 21 | 86,488 | 0 | Emission Factor | 5.57E-01 | | 24.09 | 12.04 | 12.04 | - |
| #6 DD | C-4601C | Y | Compressor | Reciprocating Gas Compressor | Existing | 21 | 86,488 | 0 | Emission Factor | 5.57E-01 | | 24.09 | 12.04 | 12.04 | - |
| #7 DD | H-4301A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 67 | 550,826 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 22.68 | 11.34 | 11.34 | - |
| #7 DD | H-4301B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 67 | 573,413 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 23.61 | 11.81 | 11.81 | - |
| #7 DD | H-4302 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 122 | 1,053,299 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 43.37 | 21.69 | 21.69 | - |
| #9 DD | H-5301A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 67 | 471,591 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 19.42 | 9.71 | 9.71 | - |
| #9 DD | H-5301B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 67 | 449,346 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 18.50 | 9.25 | 9.25 | - |
| #9 DD | H-5302 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 122 | 1,257,163 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 51.77 | 25.88 | 25.88 | - |
| LSG Unit | H-4901 | Y | Heater/Boiler | Charge Heater | Existing | 87 | 327,668 | 0 | Emission Factor | | | | 0.00 | 0.00 | [B] |
| Sulfuric Acid Plant | STK-7801 | Y | Heater/Boiler | Heater Stack | Existing | 30 | 73,671 | 0 | Emission Factor | | | 0.005794 | 0.0029 | 0.0029 | - |
| *Sulfuric Acid Plant* | *H-7801* | Y | Heater/Boiler | *Process Air Heater* | *Existing* | | | | Emission Factor | | | | *0.00* | | |

**Table C-3 Summary of Combustion Units CO BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Sulfuric Acid Plant* | *H-7802* | Y | Heater/Boiler | *Converter Heater* | *Existing* | | | | Emission Factor | | | | *0.00* | | |
| *Sulfuric Acid Plant* | *R-7801* | Y | Heater/Boiler | *Startup Heater* | *Existing* | | | | Emission Factor | | | | *0.00* | | |
| #1 SRU Incinerator | H-1032 | Y | Heater/Boiler | Tail Gas Incinerator | Existing | 7 | 9,702 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 0.40 | 0.20 | 0.20 | - |
| #2 SRU Incinerator | H-1042 | Y | Heater/Boiler | Tail Gas Incinerator | Existing | 15 | 73,434 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 3.02 | 1.51 | 1.51 | - |
| #1 Beavon | H-1061 | Y | TGTU | Sulfur Recovery Units, Tail gas treatment | Existing | 10 | | | Emission Factor | | | | 60.65 | 60.65 | - |
| #2 Beavon | H-4761 | Y | TGTU | Tail Gas Treatment | Existing | 10 | | | Emission Factor | | | | 41.13 | 41.13 | - |
| East Incinerator | H-4745 | Y | Heater/Boiler | Tail Gas Incinerator | Existing | 55 | 142,237 | 0 | Emission Factor | 8.24E-02 | 3.38E-02 | 5.86 | 2.93 | 2.93 | - |
| Delayed Coker Unit | H-8501A | Y | Heater/Boiler | Coker process heater 1 | Existing | 200 | 2,480,262 | 0 | Emission Factor | 2.64E-03 | | 3.27 | 1.64 | 1.64 | - |
| Delayed Coker | H-8501B | Y | Heater/Boiler | Coker process heater | Existing | 200 | 2,472,154 | 0 | Emission Factor | 2.50E-03 | | 3.09 | 1.55 | 1.55 | - |
| Utility II | #5 Boiler (B-1155) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 539 | 1,765,918 | 811,841 | Emission Factor | 8.24E-02 | 3.38E-02 | 86.43 | 43.21 | 43.21 | - |
| Utility III | #6 Boiler (B-3301) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 257 | 1,271,145 | 480,095 | Emission Factor | 8.24E-02 | 3.38E-02 | 60.45 | 30.23 | 30.22 | [D] |
| Utility III | #7 Boiler (B-3302) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 257 | 1,133,369 | 511,268 | Emission Factor | 8.24E-02 | 3.38E-02 | 55.30 | 27.65 | 27.65 | [D] |
| Utility III | #8 Boiler (B-3303) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 512 | 2,503,750 | 1,163,089 | Emission Factor | 8.24E-02 | 3.38E-02 | 122.74 | 61.37 | 61.37 | - |
| Utility III | #9 Boiler (B-3304) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 512 | 1,976,231 | 977,844 | Emission Factor | 8.24E-02 | 3.38E-02 | 97.89 | 48.95 | 48.95 | - |
| Utility III | #10 Boiler (B-3701) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 225 | 1,532,157 | 0 | Emission Factor | | | 47.26 | 23.63 | 23.63 | - |
| Powerhouse 2 | GT No. 4 (G-3404) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 317 | 3,609,299 | 428,205 | Emission Factor | 8.20E-02 | 3.30E-03 | 148.69 | 74.34 | 74.34 | - |
| Powerhouse 2 | GT No. 5 (G-3405) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 317 | 3,657,276 | 201,966 | Emission Factor | 8.20E-02 | 3.30E-03 | 150.28 | 75.14 | 75.14 | - |
| Powerhouse 2 | GT No. 7 (G-3407) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 317 | 3,981,360 | 474,168 | Emission Factor | 8.20E-02 | 3.30E-03 | 164.02 | 82.01 | 82.01 | - |
| Powerhouse 2 | GT No. 8 (G-3408) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 392 | 1,787,553 | 506,126 | Emission Factor | 8.20E-02 | 3.30E-03 | 74.12 | 37.06 | 37.06 | - |
| Powerhouse 2 | GT No. 9 (G-3409) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 304 | 4,439,104 | 280,162 | CEMS | | | 30.06 | 15.03 | 14.95 | [C] |
| Powerhouse 2 | GT No. 10 (G-3410) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 325 (5) | 3,551,385 | 207,405 | CEMS | | | 29.98 | 14.99 | 14.91 | [C] |
| GT No. 13 and Duct Burner | GT No. 13 (G-3413) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 626 | 5,968,643 | 546,683 | CEMS | | | 14.86 | 7.43 | 7.43 | - |
| | | | | | | | | | | | | Total tpy | 1904.47 | 1904.32 | |

Notes: "-" indicates no adjustments to the BAE were required.

[A] Emission factor presented is an average of 2009 and 2010 factors derived from quarterly tests. See Table C-xx Combustion Unit Emission Factors for specific information.

[B] Conservatively assumed zero contribution to the BAE used to set the proposed PAL.

[C] GT9 and GT10 are subject to CO concentration limits of 206.5 ppm when firing gas and 242 ppm when firing oil. The available mass emission rates were conservativley adjusted to address exceedances of these limits. The highest n mass emissions rates were identified for each quarter, where n is equal to the hours of exceedance in that quarter, and set to have zero contribution ot the BAE used to set the proposed PAL.

[D] Emissions were downwardly adjusted for fuel oil usage of 35 barrels (bbls) above the combined 800 bbls/day limit for Boilers 6 & 7. Adjustment assumes equal firing rate for Boilers 6 & 7.

## Table C-4 Summary of Non-Combustion Units CO BAE

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Emission Calculation Parameter | Baseline Period 24 Month Parameter Total | Units | Emission Factor/Method | Emission Factor Units | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #2 Platformer | #2 Plat Vent | Y | Process | Plat No. 2 Catalyst Regen Vent | Existing | Operation | 4,135 | hrs | 0.15 | lb/hr | 0.31 | 0.16 | 0.16 | - |
| #3 Platformer | #3 Plat Vent | Y | Process | Plat No. 3 Catalyst Regen Vent | Existing | Operation | 12,829 | hrs | 0.15 | lb/hr | 0.96 | 0.48 | 0.48 | - |
| #4 Platformer | #4 Plat Vent | Y | Process | Plat No. 4 Catalyst Regen Vent | Existing | Operation | 11,661 | hrs | 0.15 | lb/hr | 0.87 | 0.44 | 0.44 | - |
| FCCU | STK-7051 | Y | WGS | Fluid Catalytic Cracking | Existing | | | | CEMS | | | 127.35 | 126.59 | [A] |
| Sulfuric Acid Plant | STK-7802 | Y | Process | Process Stack | Existing | | | | | | | 0.00 | 0.00 | [B] |
| Refinery Flare System | #2 Flare (H-1105) | Y | Flare | Gas burner | Existing | Heat Release | 3,163,635 | MMBtu | 0.34 | lb/MMBtu | 544 | 272.15 | 272.15 | - |
| Refinery Flare System | #3 Flare (H-1104) | Y | Flare | Gas burner | Existing | Heat Release | 1,574,064 | MMBtu | 0.34 | lb/MMBtu | 271 | 135.41 | 135.41 | - |
| Refinery Flare System | #5 Flare (H-3351) | Y | Flare | Gas burner | Existing | Heat Release | 2,291,870 | MMBtu | 0.34 | lb/MMBtu | 394 | 197.16 | 197.16 | - |
| Refinery Flare System | #6 Flare (H-3352) | Y | Flare | Gas burner | Existing | Heat Release | 1,134,206 | MMBtu | 0.34 | lb/MMBtu | 195 | 97.57 | 97.57 | - |
| Refinery Flare System | #7 Flare (H-3301) | Y | Flare | Gas burner | Existing | Heat Release | 3,730,347 | MMBtu | 0.34 | lb/MMBtu | 642 | 320.90 | 320.90 | - |
| Refinery Flare System | LPG Flare (STK 7921) | Y | Flare | Gas burner, steam assisted | Existing | Heat Release | 0 | MMBtu | 0.34 | lb/MMBtu | 0 | 0.00 | 0.00 | - |
| Refinery Flare System | FCC Flare (L.P. Flare - STK 7941) | Y | Flare | Gas burner, steam assisted | Existing | Heat Release | 2,541,561 | MMBtu | 0.34 | lb/MMBtu | 437 | 218.64 | 218.64 | - |
| Refinery Flare System | Ground Flare (H.P. Flare - STK 7942) | Y | Flare | Gas burner | Existing | Heat Release | 451,355 | MMBtu | 0.34 | lb/MMBtu | 78 | 38.83 | 38.83 | - |
| Delayed Coker Unit | TK-8501 | Y | Tank Fug | Fixed roof storage tank (pitch) | Existing | | | | AP-42 | | | 0.04 | 0.04 | [D] |
| Coker Complex | Delayed Coker Steam Vent | Y | Process | Delayed Coker Steam Vent | Existing | Coker Drum Vent Episodes | 1,442 | Episodes | 2 | lbs/episode | 1.4 | 0.72 | 0.72 | - |
| Fire Training | Fire Training | Y | Flare | Fire Training | Existing | Fuel Usage | 48,778 | lbs | 0.56 | lb/lb fuel | 13.66 | 6.83 | 6.83 | [C] |
| | | | | | | | | | | | Total tpy | 1417 | 1416 | |

Notes: "-" indicates no adjustments to the BAE were required.

[A] CO BAE for the FCCU was adjusted for 3 hours of exceedance of the 500 ppm/432 ppm concentration limit.

[B] Sulfuric Acid Plant process stack is not a source of CO emissions

[C] Emission factors for fire traing (JP-4) per "Calculation Methods for Criteria Air Pollutant Emission Inventories", Brooks Air Force Base, TX, July 1994

[D] Emissions based on AP-42 Chapter 11.1.2.5. CO emissions can be estimated by multiplying the THC emissions by the TANKS program by 0.097.

**Table C-5 Summary of Combustion Units NOx BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #2 DU Fractionator | H-101 | Y | Heater/Boiler | Heater | Existing | 146 | 791,295 | 43,469 | Emission Factor | 2.75E-01 | 3.18E-01 | 115.51 | 57.76 | 57.76 | - |
| #2 DU Fractionator | H-104 | Y | Heater/Boiler | Heater | Existing | 108 | 654,318 | 40,043 | Emission Factor | 2.75E-01 | 3.18E-01 | 96.17 | 48.08 | 48.08 | - |
| #2 CDU | H-401A | Y | Heater/Boiler | Charge Heater | Existing | 171 | 828,797 | 257,804 | Emission Factor | 2.75E-01 | 3.18E-01 | 154.69 | 77.35 | 77.35 | - |
| #2 CDU | H-401B | Y | Heater/Boiler | Charge Heater | Existing | 171 | 828,797 | 257,804 | Emission Factor | 2.75E-01 | 3.18E-01 | 154.69 | 77.35 | 77.35 | - |
| #2 CDU | H-401C | Y | Heater/Boiler | Charge Heater | Existing | 171 | 828,797 | 257,804 | Emission Factor | 2.75E-01 | 3.18E-01 | 154.69 | 77.35 | 77.35 | - |
| #3 DD | C-1500A | Y | Compressor | Reciprocating Gas Compressor | Existing | 3 | 15,104 | 0 | Emission Factor | 2.27E+00 | | 17.14 | 8.57 | 8.57 | - |
| #3 DD | C-1500B | Y | Compressor | Reciprocating Gas Compressor | Existing | 3 | 15,104 | 0 | Emission Factor | 2.27E+00 | | 17.14 | 8.57 | 8.57 | - |
| #3 DD | C-1500C | Y | Compressor | Reciprocating Gas Compressor | Existing | 3 | 15,104 | 0 | Emission Factor | 2.27E+00 | | 17.14 | 8.57 | 8.57 | - |
| Penex | H-200 | Y | Heater/Boiler | Charge Heater | Existing | 37 | 389,579 | 0 | Emission Factor | 1.91E-01 | | 37.20 | 18.60 | 18.60 | - |
| Penex | H-201 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 37 | 395,352 | 0 | Emission Factor | 1.50E-01 | | 29.65 | 14.83 | 14.83 | - |
| Penex | H-202 | Y | Heater/Boiler | Hot Oil Heater | Existing | 122 | 874,691 | 0 | Emission Factor | 2.75E-01 | 3.18E-01 | 120.06 | 60.03 | 60.03 | - |
| Penex | C-200A | Y | Compressor | Reciprocating Gas Compressor | Existing | 9 | 75,121 | 0 | Emission Factor | 1.55E-01 | | 7.77 | 3.88 | 3.88 | [A] |
| Penex | C-200B | Y | Compressor | Reciprocating Gas Compressor | Existing | 9 | 75,121 | 0 | Emission Factor | 1.15E-01 | | 3.76 | 1.88 | 1.88 | [A] |
| Penex | C-200C | Y | Compressor | Reciprocating Gas Compressor | Existing | 9 | 75,121 | 0 | Emission Factor | 8.25E-02 | | 3.69 | 1.85 | 1.85 | [A] |
| Utility Fractionation | H-160 | Y | Heater/Boiler | Charge Heater | Existing | 135 | 884,143 | 0 | Emission Factor | 2.75E-01 | 3.18E-01 | 121.35 | 60.68 | 60.68 | - |
| #2 Platformer | H-601 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 36 | 221,021 | 0 | Emission Factor | 2.75E-01 | 3.18E-01 | 30.34 | 15.17 | 15.17 | - |
| #2 Platformer | H-604 | Y | Heater/Boiler | Platforming No. 2 Interheater | Existing | 37 | 214,990 | 0 | Emission Factor | 2.75E-01 | 3.18E-01 | 29.51 | 14.75 | 14.75 | - |
| #2 Platformer | H-605 | Y | Heater/Boiler | Platforming No. 3 Interheater | Existing | 15 | 59,776 | 0 | Emission Factor | 2.75E-01 | 3.18E-01 | 8.20 | 4.10 | 4.10 | - |
| #2 DU | H-800A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 43 | 461,566 | 0 | Emission Factor | 2.75E-01 | 3.18E-01 | 63.35 | 31.68 | 31.68 | - |
| #2 DU | H-800B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 43 | 441,880 | 0 | Emission Factor | 2.75E-01 | 3.18E-01 | 60.65 | 30.33 | 30.33 | - |
| #2 DU | H-801 | Y | Heater/Boiler | Stripper Heater | Existing | 101 | 803,114 | 0 | Emission Factor | 9.40E-02 | | 37.75 | 18.87 | 18.87 | - |
| #4 DD | H-2201A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 61 | 690,666 | 0 | Emission Factor | 2.75E-01 | 3.18E-01 | 94.80 | 47.40 | 47.40 | - |
| #4 DD | H-2201B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 61 | 690,666 | 0 | Emission Factor | 2.75E-01 | 3.18E-01 | 94.80 | 47.40 | 47.40 | - |
| #4 DD | H-2202 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 119 | 980,002 | 0 | Emission Factor | 1.32E-01 | | 64.68 | 32.34 | 32.34 | - |
| #5 DD | H-2400 | Y | Heater/Boiler | Charge Heater | Existing | 33 | 463,511 | 0 | Emission Factor | 2.75E-01 | 3.18E-01 | 63.62 | 31.81 | 31.81 | - |
| #5 DD | C-2400A | Y | Compressor | Reciprocating Gas Compressor | Existing | 7 | 48,723 | 0 | Emission Factor | 3.78E-01 | | 8.34 | 4.17 | 4.17 | [A] |
| #5 DD | C-2400B | Y | Compressor | Reciprocating Gas Compressor | Existing | 7 | 48,723 | 0 | Emission Factor | 6.50E-02 | | 1.38 | 0.69 | 0.69 | [A] |
| Naphtha Fractionation | H-2501 | Y | Heater/Boiler | Reboiler Heater | Existing | 203 | 437,565 | 0 | Emission Factor | 8.50E-02 | | 18.60 | 9.30 | 9.30 | - |
| #2 Sulfolane | H-4502 | Y | Heater/Boiler | Benzene Column Reboiler Heater | Existing | 149 | 858,943 | 0 | Emission Factor | 2.75E-01 | 3.18E-01 | 117.89 | 58.95 | 58.95 | - |

**Table C-5 Summary of Combustion Units NOx BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #2 Sulfolane | H-4503 | Y | Heater/Boiler | Toluene Column Reboiler Heater | Existing | 141 | 753,962 | 0 | Emission Factor | 2.75E-01 | | 103.49 | 51.74 | 51.74 | - |
| #2 Sulfolane | H-4504 | Y | Heater/Boiler | Xylene Column Reboiler Heater | Existing | 126 | 607,009 | 0 | Emission Factor | 2.75E-01 | 3.18E-01 | 83.31 | 41.66 | 41.66 | - |
| #2 Sulfolane | H-4505 | Y | Heater/Boiler | Raffinate Splitter Reboiler Heater | Existing | 109 | 470,895 | 0 | Emission Factor | 2.75E-01 | 3.18E-01 | 64.63 | 32.32 | 32.32 | - |
| #5 CDU | H-3101A | Y | Heater/Boiler | Crude Charge Heater | Existing | 381 | 2,184,815 | 614,217 | Emission Factor | 2.75E-01 | 3.18E-01 | 397.40 | 198.70 | 198.70 | - |
| #5 CDU | H-3101B | Y | Heater/Boiler | Crude Charge Heater | Existing | 381 | 2,436,185 | 659,430 | Emission Factor | 2.75E-01 | 3.18E-01 | 439.09 | 219.54 | 219.54 | - |
| #6 CDU | H-4101A | Y | Heater/Boiler | Crude Charge Heater | Existing | 381 | 2,446,267 | 516,409 | Emission Factor | 2.75E-01 | 3.18E-01 | 417.76 | 208.88 | 208.88 | - |
| #6 CDU | H-4101B | Y | Heater/Boiler | Crude Charge Heater | Existing | 381 | 2,817,416 | 557,900 | Emission Factor | 2.75E-01 | 3.18E-01 | 475.29 | 237.64 | 237.64 | - |
| #3 Platformer | H-4401 | Y | Heater/Boiler | Charge Heater | Existing | 134 | 1,025,393 | 0 | Emission Factor | 1.30E-01 | | 66.65 | 33.33 | 33.33 | - |
| #3 Platformer | H-4402 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 128 | 721,833 | 0 | Emission Factor | 2.75E-01 | 3.18E-01 | 99.08 | 49.54 | 49.54 | - |
| #3 Platformer | H-4451 | Y | Heater/Boiler | Charge Heater | Existing | 381 | 2,918,945 | 0 | Emission Factor | 1.52E-01 | | 221.84 | 110.92 | 110.92 | - |
| #3 Platformer | H-4452 | Y | Heater/Boiler | Intermediate Heater | Existing | 248 | 1,803,863 | 0 | Emission Factor | 1.52E-01 | | 137.09 | 68.55 | 68.55 | - |
| #3 Platformer | H-4453 | Y | Heater/Boiler | Intermediate Heater | Existing | 248 | 1,338,392 | 0 | Emission Factor | 1.52E-01 | | 101.72 | 50.86 | 50.86 | - |
| #3 Platformer | H-4454 | Y | Heater/Boiler | Intermediate Heater | Existing | 77 | 518,276 | 0 | Emission Factor | 1.52E-01 | | 39.39 | 19.69 | 19.69 | - |
| #3 Platformer | H-4455 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 138 | 1,076,287 | 0 | Emission Factor | 9.00E-02 | | 48.43 | 24.22 | 24.22 | - |
| #3 VAC | H-4201 | Y | Heater/Boiler | Prestripper Heater | Existing | 253 | 1,195,811 | 545,534 | Emission Factor | 2.75E-01 | 3.18E-01 | 250.75 | 125.38 | 125.38 | - |
| #3 VAC | H-4202 | Y | Heater/Boiler | Vacuum Heater | Existing | 245 | 962,882 | 553,169 | Emission Factor | 2.75E-01 | 3.18E-01 | 219.99 | 110.00 | 110.00 | - |
| #4 Platformer | H-5401 | Y | Heater/Boiler | Charge Heater | Existing | 134 | 983,723 | 0 | Emission Factor | 1.23E-01 | | 60.50 | 30.25 | 30.25 | - |
| #4 Platformer | H-5402 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 128 | 684,930 | 0 | Emission Factor | 2.75E-01 | 3.18E-01 | 94.01 | 47.01 | 47.01 | - |
| #4 Platformer | H-5451 | Y | Heater/Boiler | Charge Heater | Existing | 381 | 2,059,984 | 0 | Emission Factor | 1.42E-01 | | 146.26 | 73.13 | 73.13 | - |
| #4 Platformer | H-5452 | Y | Heater/Boiler | Intermediate Heater | Existing | 248 | 1,843,813 | 0 | Emission Factor | 1.42E-01 | | 130.91 | 65.46 | 65.46 | - |
| #4 Platformer | H-5453 | Y | Heater/Boiler | Intermediate Heater | Existing | 248 | 1,356,092 | 0 | Emission Factor | 1.42E-01 | | 96.28 | 48.14 | 48.14 | - |
| #4 Platformer | H-5454 | Y | Heater/Boiler | Intermediate Heater | Existing | 77 | 491,861 | 0 | Emission Factor | 1.42E-01 | | 34.92 | 17.46 | 17.46 | - |
| #4 Platformer | H-5455 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 138 | 1,014,968 | 0 | Emission Factor | 1.19E-01 | | 60.39 | 30.20 | 30.20 | - |
| #6 DD | H-4601A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 61 | 307,355 | 0 | Emission Factor | 9.80E-02 | | 15.07 | 7.53 | 7.53 | - |
| #6 DD | H-4601B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 61 | 306,150 | 0 | Emission Factor | 9.80E-02 | | 15.01 | 7.50 | 7.50 | - |
| #6 DD | H-4602 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 119 | 669,854 | 0 | Emission Factor | 1.07E-01 | | 35.84 | 17.92 | 17.92 | - |
| #6 DD | C-4601A | Y | Compressor | Reciprocating Gas Compressor | Existing | 21 | 86,488 | 0 | Emission Factor | 3.59E+00 | | 155.18 | 77.59 | 77.59 | - |
| #6 DD | C-4601B | Y | Compressor | Reciprocating Gas Compressor | Existing | 21 | 86,488 | 0 | Emission Factor | 3.46E+00 | | 149.69 | 74.84 | 74.84 | - |

**Table C-5 Summary of Combustion Units NOx BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #6 DD | C-4601C | Y | Compressor | Reciprocating Gas Compressor | Existing | 21 | 86,488 | 0 | Emission Factor | 3.24E+00 | | 139.89 | 69.95 | 69.95 | - |
| #7 DD | H-4301A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 67 | 550,826 | 0 | Emission Factor | 9.80E-02 | 3.18E-01 | 27.00 | 13.50 | 13.50 | - |
| #7 DD | H-4301B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 67 | 573,413 | 0 | Emission Factor | 9.80E-02 | 3.18E-01 | 28.11 | 14.05 | 14.05 | - |
| #7 DD | H-4302 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 122 | 1,053,299 | 0 | Emission Factor | 1.02E-01 | | 53.72 | 26.86 | 26.86 | - |
| #9 DD | H-5301A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 67 | 471,591 | 0 | Emission Factor | 9.80E-02 | 3.18E-01 | 23.12 | 11.56 | 11.56 | - |
| #9 DD | H-5301B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 67 | 449,346 | 0 | Emission Factor | 9.80E-02 | 3.18E-01 | 22.03 | 11.01 | 11.01 | - |
| #9 DD | H-5302 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 122 | 1,257,163 | 0 | Emission Factor | 1.18E-01 | 3.18E-01 | 74.17 | 37.09 | 37.09 | - |
| LSG Unit | H-4901 | Y | Heater/Boiler | Charge Heater | Existing | 87 | 327,668 | 0 | Emission Factor | | | | 0.00 | 0.00 | [G] |
| Sulfuric Acid Plant | STK-7801 | Y | Heater/Boiler | Heater Stack | Existing | 30 | 119,284 | 0 | Emission Factor | 0.092 | | 5.49 | 2.74 | 2.74 | - |
| *Sulfuric Acid Plant* | *H-7801* | *Y* | *Heater/Boiler* | *Process Air Heater* | *Existing* | | | | Emission Factor | | | | *0.00* | | |
| *Sulfuric Acid Plant* | *H-7802* | *Y* | *Heater/Boiler* | *Converter Heater* | *Existing* | | | | Emission Factor | | | | *0.00* | | |
| *Sulfuric Acid Plant* | *R-7801* | *Y* | *Heater/Boiler* | *Startup Heater* | *Existing* | | | | Emission Factor | | | | *0.00* | | |
| #1 SRU Incinerator | H-1032 | Y | Heater/Boiler | Tail Gas Incinerator | Existing | 7 | 9,702 | 0 | Emission Factor | 2.75E-01 | 3.18E-01 | 1.33 | 0.67 | 0.67 | - |
| #2 SRU Incinerator | H-1042 | Y | Heater/Boiler | Tail Gas Incinerator | Existing | 15 | 73,434 | 0 | Emission Factor | 2.75E-01 | 3.18E-01 | 10.08 | 5.04 | 5.04 | - |
| #1 Beavon | H-1061 | Y | TGTU | Sulfur Recovery Units, Tail gas treatment | Existing | 10 | 0 | 0 | Emission Factor | | | | 1.98 | 1.98 | - |
| #2 Beavon | H-4761 | Y | TGTU | Tail Gas Treatment | Existing | 10 | 0 | 0 | Emission Factor | | | | 1.97 | 1.97 | - |
| East Incinerator | H-4745 | Y | Heater/Boiler | Tail Gas Incinerator | Existing | 55 | 142,237 | 0 | Emission Factor | 2.75E-01 | 3.18E-01 | 19.52 | 9.76 | 9.76 | - |
| Delayed Coker Unit | H-8501A | Y | Heater/Boiler | Coker process heater 1 | Existing | 200 | 2,480,262 | 0 | Emission Factor | 2.58E-02 | | 32.00 | 16.00 | 16.00 | - |
| Delayed Coker | H-8501B | Y | Heater/Boiler | Coker process heater | Existing | 200 | 2,472,154 | 0 | Emission Factor | 2.88E-02 | | 35.64 | 17.82 | 17.82 | - |
| Utility II | #5 Boiler (B-1155) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 539 | 1,765,918 | 811,841 | Emission Factor | 2.75E-01 | 3.18E-01 | 371.29 | 185.64 | 149.18 | [B] |
| Utility III | #6 Boiler (B-3301) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 257 | 1,271,145 | 480,095 | Emission Factor | 2.75E-01 | 3.18E-01 | 250.70 | 125.35 | 125.33 | [H] |
| Utility III | #7 Boiler (B-3302) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 257 | 1,133,369 | 511,268 | Emission Factor | 2.75E-01 | 3.18E-01 | 236.74 | 118.37 | 118.35 | [H] |
| Utility III | #8 Boiler (B-3303) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 512 | 2,503,750 | 1,163,089 | Emission Factor | 2.75E-01 | 3.18E-01 | 528.33 | 264.17 | 212.42 | [B] |
| Utility III | #9 Boiler (B-3304) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 512 | 1,976,231 | 977,844 | Emission Factor | 2.75E-01 | 3.18E-01 | 426.51 | 213.26 | 172.15 | [B] |
| Utility III | #10 Boiler (B-3701) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 225 | 1,532,157 | 0 | Emission Factor | CEMS | CEMS | 24.97 | 12.49 | 27.17 | [D] |
| Powerhouse 2 | GT No. 4 (G-3404) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 317 | 3,609,299 | 428,205 | Emission Factor | 5.18E-01 | 5.18E-01 | 1045.71 | 522.86 | 522.86 | - |

**Table C-5 Summary of Combustion Units NOx BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Powerhouse 2 | GT No. 5 (G-3405) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 317 | 3,657,276 | 201,966 | Emission Factor | 5.22E-01 | 5.22E-01 | 1007.26 | 503.63 | 503.63 | - |
| Powerhouse 2 | GT No. 7 (G-3407) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 317 | 3,981,360 | 474,168 | Emission Factor | 6.66E-01 | 6.66E-01 | 1483.69 | 741.85 | 655.15 | [C] |
| Powerhouse 2 | GT No. 8 (G-3408) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 392 | 1,787,553 | 506,126 | Emission Factor | 6.25E-01 | 6.25E-01 | 716.77 | 358.39 | 355.29 | [C] |
| Powerhouse 2 | GT No. 9 (G-3409) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 304 | 4,439,104 | 280,162 | CEMS | | | 158.97 | 79.49 | 79.10 | [E] |
| Powerhouse 2 | GT No. 10 (G-3410) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 325 (5) | 3,551,385 | 207,405 | CEMS | | | 175.91 | 87.96 | 87.50 | [E] |
| GT No. 13 and Duct Burner | GT No. 13 (G-3413) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 626 | 5,968,643 | 546,683 | CEMS | | | 55.23 | 27.61 | 27.24 | [E] |
| | | | | | | | | | | | | Total tpy | 6,433 | 6,228 | |

Notes: "-" indicates no adjustments to the BAE were required.

[A] Emission factor presented is an average of 2009 and 2010 factors derived from quarterly tests. See Table C-xx Combustion Unit Emission Factors for specific information.

[B] Adjusted for NSPS Subpart D 60.44(a)(1) and 60.44(a)(2) compliance (0.2lb NOx/MMBtu when firing fuel gas and 0.3 lb NOx/MMBtu when firing distillate/oil)

[C] Adjusted for NSPS Subpart GG 60.332(a)(2) compliance.

[D] NOx BAE for Boiler #10 adjusted for 9.2 hours of exceedance of the 0.07lb/MMBTU limit. Conservately subtracted for those hours emissions from firing at the maximum capacity at the highest rate of exceedance (i.e., 0.123 lb/MMBTU)

[E] GT9 and GT10 are subject to NOx limits of 42 ppm and 57 lb/hr. The available mass emission rates were conservativley adjusted to address exceedances of these limits. The highest n mass emissions rates were identified for each quarter, where n is equal to the hours of exceedance in that quarter, and set to have zero contribution ot the BAE used to set the proposed PAL.

[F] GT13 is subject to NOx limits of 0.0497 lb/MMBtu when firing gas and 0.761 lb/MMBtu when firing oil. The NOx emissions rates for the time of the exceedance was downwardly adjusted to the appropriate fuel-based limit.

[G] Conservatively assumed zero contribution to the BAE used to set the proposed PAL.

[H] Emissions were downwardly adjusted for fuel oil usage of 35 barrels (bbls) above the combined 800 bbls/day limit for Boilers 6 & 7. Adjustment assumes equal firing rate for Boilers 6 & 7.

## Table C-6 Summary of Non-Combustion Units NOx BAE

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Emission Calculation Parameter | Baseline Period 24 Month Parameter Total | Units | Emission Factor/Method | Emission Factor Units | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #2 Platformer | #2 Plat Vent | Y | Process | Plat No. 2 Catalyst Regen Vent | Existing | Operation | 4,135 | hrs | 5.33E-04 | lb/hr | 0.00 | 0.00 | 0.00 | - |
| #3 Platformer | #3 Plat Vent | Y | Process | Plat No. 3 Catalyst Regen Vent | Existing | Operation | 12,829 | hrs | 9.60E-04 | lb/hr | 0.01 | 0.00 | 0.00 | - |
| #4 Platformer | #4 Plat Vent | Y | Process | Plat No. 4 Catalyst Regen Vent | Existing | Operation | 11,661 | hrs | 9.60E-04 | lb/hr | 0.01 | 0.00 | 0.00 | - |
| FCCU | STK-7051 | Y | WGS | Fluid Catalytic Cracking | Existing | | | | CEMS | | | 88.38 | 88.38 | - |
| Sulfuric Acid Plant | STK-7802 | Y | Process | Process Stack | Existing | | | | | | | 8.12 | 8.12 | - |
| Refinery Flare System | #2 Flare (H-1105) | Y | Flare | Gas burner | Existing | Heat Release | 3,163,635 | MMBtu | 6.80E-02 | lb/MMBtu | 1.08E+02 | 53.78 | 53.78 | - |
| Refinery Flare System | #3 Flare (H-1104) | Y | Flare | Gas burner | Existing | Heat Release | 1,574,064 | MMBtu | 6.80E-02 | lb/MMBtu | 5.35E+01 | 26.76 | 26.76 | - |
| Refinery Flare System | #5 Flare (H-3351) | Y | Flare | Gas burner | Existing | Heat Release | 2,291,870 | MMBtu | 6.80E-02 | lb/MMBtu | 7.79E+01 | 38.96 | 38.96 | - |
| Refinery Flare System | #6 Flare (H-3352) | Y | Flare | Gas burner | Existing | Heat Release | 1,134,206 | MMBtu | 6.80E-02 | lb/MMBtu | 3.86E+01 | 19.28 | 19.28 | - |
| Refinery Flare System | #7 Flare (H-3301) | Y | Flare | Gas burner | Existing | Heat Release | 3,730,347 | MMBtu | 6.80E-02 | lb/MMBtu | 1.27E+02 | 63.42 | 63.42 | - |
| Refinery Flare System | LPG Flare (STK 7921) | Y | Flare | Gas burner, steam assisted | Existing | Heat Release | 0 | MMBtu | 6.80E-02 | lb/MMBtu | 0.00E+00 | 0.00 | 0.00 | - |
| Refinery Flare System | FCC Flare (L.P. Flare - STK 7941) | Y | Flare | Gas burner, steam assisted | Existing | Heat Release | 2,541,561 | MMBtu | 6.80E-02 | lb/MMBtu | 8.64E+01 | 43.21 | 43.21 | - |
| Refinery Flare System | Ground Flare (H.P. Flare - STK 7942) | Y | Flare | Gas burner | Existing | Heat Release | 451,355 | MMBtu | 6.80E-02 | lb/MMBtu | 1.53E+01 | 7.67 | 7.67 | - |
| Coker Complex | Delayed Coker Steam Vent | Y | Process | Delayed Coker Steam Vent | Existing | | | | | | | | | [A] |
| Fire Training | Fire Training | Y | Flare | Fire Training | Existing | | 48,778 | lbs | 4.20E-03 | lb/lb fuel | 1.02E-01 | 0.051 | 0.051 | [B] |
| | | | | | | | | | | | Total tpy | 350 | 350 | |

Notes: "-" indicates no adjustments to the BAE were required.

[A] Delayed coker steam vent is not a source of NOx emissions.

[B] Emission factors for fire traing (JP-4) per "Calculation Methods for Criteria Air Pollutant Emission Inventories", Brooks Air Force Base, TX, July 1994

## Table C-7 Summary of Combustion Units PM BAE

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate/6-Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #2 DU Fractionator | H-101 | Y | Heater/Boiler | Heater | Existing | 146 | 791,295 | 43,469 | Emission Factor | 1.86E-03 | 4.46E-02 | 1.71 | 0.85 | 0.85 | [D] |
| #2 DU Fractionator | H-104 | Y | Heater/Boiler | Heater | Existing | 108 | 654,318 | 40,043 | Emission Factor | 1.86E-03 | 4.46E-02 | 1.50 | 0.75 | 0.75 | [D] |
| #2 CDU | H-401A | Y | Heater/Boiler | Charge Heater | Existing | 171 | 828,797 | 257,804 | Emission Factor | 1.86E-03 | 4.46E-02 | 6.52 | 3.27 | 3.27 | [D] |
| #2 CDU | H-401B | Y | Heater/Boiler | Charge Heater | Existing | 171 | 828,797 | 257,804 | Emission Factor | 1.86E-03 | 4.46E-02 | 6.52 | 3.27 | 3.27 | [D] |
| #2 CDU | H-401C | Y | Heater/Boiler | Charge Heater | Existing | 171 | 828,797 | 257,804 | Emission Factor | 1.86E-03 | 4.46E-02 | 6.52 | 3.27 | 3.27 | [D] |
| #3 DD | C-1500A | Y | Compressor | Reciprocating Gas Compressor | Existing | 3 | 15,104 | 0 | Emission Factor | 9.50E-03 | | 0.07 | 0.04 | 0.04 | - |
| #3 DD | C-1500B | Y | Compressor | Reciprocating Gas Compressor | Existing | 3 | 15,104 | 0 | Emission Factor | 9.50E-03 | | 0.07 | 0.04 | 0.04 | - |
| #3 DD | C-1500C | Y | Compressor | Reciprocating Gas Compressor | Existing | 3 | 15,104 | 0 | Emission Factor | 9.50E-03 | | 0.07 | 0.04 | 0.04 | - |
| Penex | H-200 | Y | Heater/Boiler | Charge Heater | Existing | 37 | 389,579 | 0 | Emission Factor | 1.86E-03 | | 0.36 | 0.18 | 0.18 | - |
| Penex | H-201 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 37 | 395,352 | 0 | Emission Factor | 1.86E-03 | | 0.37 | 0.18 | 0.18 | - |
| Penex | H-202 | Y | Heater/Boiler | Hot Oil Heater | Existing | 122 | 874,691 | 0 | Emission Factor | 1.86E-03 | 4.46E-02 | 0.81 | 0.41 | 0.41 | - |
| Penex | C-200A | Y | Compressor | Reciprocating Gas Compressor | Existing | 9 | 75,121 | 0 | Emission Factor | 9.50E-03 | | 0.36 | 0.18 | 0.18 | - |
| Penex | C-200B | Y | Compressor | Reciprocating Gas Compressor | Existing | 9 | 75,121 | 0 | Emission Factor | 9.50E-03 | | 0.36 | 0.18 | 0.18 | - |
| Penex | C-200C | Y | Compressor | Reciprocating Gas Compressor | Existing | 9 | 75,121 | 0 | Emission Factor | 9.50E-03 | | 0.36 | 0.18 | 0.18 | - |
| Utility Fractionation | H-160 | Y | Heater/Boiler | Charge Heater | Existing | 135 | 884,143 | 0 | Emission Factor | 1.86E-03 | 4.46E-02 | 0.82 | 0.41 | 0.41 | - |
| #2 Platformer | H-601 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 36 | 221,021 | 0 | Emission Factor | 1.86E-03 | 4.46E-02 | 0.21 | 0.10 | 0.10 | - |
| #2 Platformer | H-604 | Y | Heater/Boiler | Platforming No. 2 Interheater | Existing | 37 | 214,990 | 0 | Emission Factor | 1.86E-03 | 4.46E-02 | 0.20 | 0.10 | 0.10 | - |
| #2 Platformer | H-605 | Y | Heater/Boiler | Platforming No. 3 Interheater | Existing | 15 | 59,776 | 0 | Emission Factor | 1.86E-03 | 4.46E-02 | 0.06 | 0.03 | 0.03 | - |
| #2 DU | H-800A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 43 | 461,566 | 0 | Emission Factor | 1.86E-03 | 4.46E-02 | 0.43 | 0.21 | 0.21 | - |
| #2 DU | H-800B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 43 | 441,880 | 0 | Emission Factor | 1.86E-03 | 4.46E-02 | 0.41 | 0.21 | 0.21 | [D] |
| #2 DU | H-801 | Y | Heater/Boiler | Stripper Heater | Existing | 101 | 803,114 | 0 | Emission Factor | 1.86E-03 | | 0.75 | 0.37 | 0.37 | [D] |
| #4 DD | H-2201A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 61 | 690,666 | 0 | Emission Factor | 1.86E-03 | 4.46E-02 | 0.64 | 0.32 | 0.32 | [D] |
| #4 DD | H-2201B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 61 | 690,666 | 0 | Emission Factor | 1.86E-03 | 4.46E-02 | 0.64 | 0.32 | 0.32 | [D] |

## Table C-7 Summary of Combustion Units PM BAE

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate/6-Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #4 DD | H-2202 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 119 | 980,002 | 0 | Emission Factor | 1.86E-03 | | 0.91 | 0.46 | 0.46 | [D] |
| #5 DD | H-2400 | Y | Heater/Boiler | Charge Heater | Existing | 33 | 463,511 | 0 | Emission Factor | 1.86E-03 | 4.46E-02 | 0.43 | 0.22 | 0.22 | [D] |
| #5 DD | C-2400A | Y | Compressor | Reciprocating Gas Compressor | Existing | 7 | 48,723 | 0 | Emission Factor | 9.50E-03 | | 0.23 | 0.12 | 0.12 | - |
| #5 DD | C-2400B | Y | Compressor | Reciprocating Gas Compressor | Existing | 7 | 48,723 | 0 | Emission Factor | 9.50E-03 | | 0.23 | 0.12 | 0.12 | - |
| Naphtha Fractionation | H-2501 | Y | Heater/Boiler | Reboiler Heater | Existing | 203 | 437,565 | 0 | Emission Factor | 1.86E-03 | | 0.41 | 0.20 | 0.20 | - |
| #2 Sulfolane | H-4502 | Y | Heater/Boiler | Benzene Column Reboiler Heater | Existing | 149 | 858,943 | 0 | Emission Factor | 1.86E-03 | 4.46E-02 | 0.80 | 0.40 | 0.40 | - |
| #2 Sulfolane | H-4503 | Y | Heater/Boiler | Toluene Column Reboiler Heater | Existing | 141 | 753,962 | 0 | Emission Factor | 1.86E-03 | | 0.70 | 0.35 | 0.35 | - |
| #2 Sulfolane | H-4504 | Y | Heater/Boiler | Xylene Column Reboiler Heater | Existing | 126 | 607,009 | 0 | Emission Factor | 1.86E-03 | 4.46E-02 | 0.57 | 0.28 | 0.28 | - |
| #2 Sulfolane | H-4505 | Y | Heater/Boiler | Raffinate Splitter Reboiler Heater | Existing | 109 | 470,895 | 0 | Emission Factor | 1.86E-03 | 4.46E-02 | 0.44 | 0.22 | 0.22 | - |
| #5 CDU | H-3101A | Y | Heater/Boiler | Crude Charge Heater | Existing | 381 | 2,184,815 | 614,217 | Emission Factor | 1.86E-03 | 4.46E-02 | 15.72 | 7.86 | 7.86 | [D] |
| #5 CDU | H-3101B | Y | Heater/Boiler | Crude Charge Heater | Existing | 381 | 2,436,185 | 659,430 | Emission Factor | 1.86E-03 | 4.46E-02 | 16.96 | 8.47 | 8.47 | [D] |
| #6 CDU | H-4101A | Y | Heater/Boiler | Crude Charge Heater | Existing | 381 | 2,446,267 | 516,409 | Emission Factor | 1.86E-03 | 4.46E-02 | 13.79 | 6.87 | 6.87 | [D] |
| #6 CDU | H-4101B | Y | Heater/Boiler | Crude Charge Heater | Existing | 381 | 2,817,416 | 557,900 | Emission Factor | 1.86E-03 | 4.46E-02 | 15.06 | 7.49 | 7.49 | [D] |
| #3 Platformer | H-4401 | Y | Heater/Boiler | Charge Heater | Existing | 134 | 1,025,393 | 0 | Emission Factor | 1.86E-03 | | 0.96 | 0.48 | 0.48 | - |
| #3 Platformer | H-4402 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 128 | 721,833 | 0 | Emission Factor | 1.86E-03 | 4.46E-02 | 0.67 | 0.34 | 0.34 | - |
| #3 Platformer | H-4451 | Y | Heater/Boiler | Charge Heater | Existing | 381 | 2,918,945 | 0 | Emission Factor | 1.86E-03 | | 2.72 | 1.36 | 1.36 | - |
| #3 Platformer | H-4452 | Y | Heater/Boiler | Intermediate Heater | Existing | 248 | 1,803,863 | 0 | Emission Factor | 1.86E-03 | | 1.68 | 0.84 | 0.84 | - |
| #3 Platformer | H-4453 | Y | Heater/Boiler | Intermediate Heater | Existing | 248 | 1,338,392 | 0 | Emission Factor | 1.86E-03 | | 1.25 | 0.62 | 0.62 | - |
| #3 Platformer | H-4454 | Y | Heater/Boiler | Intermediate Heater | Existing | 77 | 518,276 | 0 | Emission Factor | 1.86E-03 | | 0.48 | 0.24 | 0.24 | - |
| #3 Platformer | H-4455 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 138 | 1,076,287 | 0 | Emission Factor | 1.86E-03 | | 1.00 | 0.50 | 0.50 | - |
| #3 VAC | H-4201 | Y | Heater/Boiler | Prestripper Heater | Existing | 253 | 1,195,811 | 545,534 | Emission Factor | 1.86E-03 | 4.46E-02 | 13.27 | 6.65 | 6.65 | [D] |
| #3 VAC | H-4202 | Y | Heater/Boiler | Vacuum Heater | Existing | 245 | 962,882 | 553,169 | Emission Factor | 1.86E-03 | 4.46E-02 | 13.22 | 6.62 | 6.62 | [D] |
| #4 Platformer | H-5401 | Y | Heater/Boiler | Charge Heater | Existing | 134 | 983,723 | 0 | Emission Factor | 1.86E-03 | | 0.92 | 0.46 | 0.46 | - |

**Table C-7  Summary of Combustion Units PM BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate/6-Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #4 Platformer | H-5402 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 128 | 684,930 | 0 | Emission Factor | 1.86E-03 | 4.46E-02 | 0.64 | 0.32 | 0.32 | - |
| #4 Platformer | H-5451 | Y | Heater/Boiler | Charge Heater | Existing | 381 | 2,059,984 | 0 | Emission Factor | 1.86E-03 | | 1.92 | 0.96 | 0.96 | - |
| #4 Platformer | H-5452 | Y | Heater/Boiler | Intermediate Heater | Existing | 248 | 1,843,813 | 0 | Emission Factor | 1.86E-03 | | 1.72 | 0.86 | 0.86 | - |
| #4 Platformer | H-5453 | Y | Heater/Boiler | Intermediate Heater | Existing | 248 | 1,356,092 | 0 | Emission Factor | 1.86E-03 | | 1.26 | 0.63 | 0.63 | - |
| #4 Platformer | H-5454 | Y | Heater/Boiler | Intermediate Heater | Existing | 77 | 491,861 | 0 | Emission Factor | 1.86E-03 | | 0.46 | 0.23 | 0.23 | - |
| #4 Platformer | H-5455 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 138 | 1,014,968 | 0 | Emission Factor | 1.86E-03 | | 0.95 | 0.47 | 0.47 | - |
| #6 DD | H-4601A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 61 | 307,355 | 0 | Emission Factor | 1.86E-03 | | 0.29 | 0.14 | 0.14 | - |
| #6 DD | H-4601B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 61 | 306,150 | 0 | Emission Factor | 1.86E-03 | | 0.29 | 0.14 | 0.14 | - |
| #6 DD | H-4602 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 119 | 669,854 | 0 | Emission Factor | 1.86E-03 | | 0.62 | 0.31 | 0.31 | - |
| #6 DD | C-4601A | Y | Compressor | Reciprocating Gas Compressor | Existing | 21 | 86,488 | 0 | Emission Factor | 7.71E-05 | | 0.00 | 0.00 | 0.00 | - |
| #6 DD | C-4601B | Y | Compressor | Reciprocating Gas Compressor | Existing | 21 | 86,488 | 0 | Emission Factor | 7.71E-05 | | 0.00 | 0.00 | 0.00 | - |
| #6 DD | C-4601C | Y | Compressor | Reciprocating Gas Compressor | Existing | 21 | 86,488 | 0 | Emission Factor | 7.71E-05 | | 0.00 | 0.00 | 0.00 | - |
| #7 DD | H-4301A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 67 | 550,826 | 0 | Emission Factor | 1.86E-03 | 4.46E-02 | 0.51 | 0.26 | 0.26 | - |
| #7 DD | H-4301B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 67 | 573,413 | 0 | Emission Factor | 1.86E-03 | 4.46E-02 | 0.53 | 0.27 | 0.27 | - |
| #7 DD | H-4302 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 122 | 1,053,299 | 0 | Emission Factor | 1.86E-03 | | 0.98 | 0.49 | 0.49 | - |
| #9 DD | H-5301A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 67 | 471,591 | 0 | Emission Factor | 1.86E-03 | 4.46E-02 | 0.44 | 0.22 | 0.22 | - |
| #9 DD | H-5301B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 67 | 449,346 | 0 | Emission Factor | 1.86E-03 | 4.46E-02 | 0.42 | 0.21 | 0.21 | - |
| #9 DD | H-5302 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 122 | 1,257,163 | 0 | Emission Factor | 1.86E-03 | 4.46E-02 | 1.17 | 0.59 | 0.59 | - |
| LSG Unit | H-4901 | Y | Heater/Boiler | Charge Heater | Existing | 87 | 327,668 | 0 | Emission Factor | | | | 0.00 | 0.00 | [A] |
| Sulfuric Acid Plant | STK-7801 | Y | Heater/Boiler | Heater Stack | Existing | 30 | 119,284 | 0 | Emission Factor | 0.011 | | 0.66 | 0.33 | 0.33 | - |
| Sulfuric Acid Plant | H-7801 | Y | Heater/Boiler | Process Air Heater | Existing | | | | Emission Factor | | | | 0.00 | | |
| Sulfuric Acid Plant | H-7802 | Y | Heater/Boiler | Converter Heater | Existing | | | | Emission Factor | | | | 0.00 | | |

## Table C-7 Summary of Combustion Units PM BAE

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate/6-Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfuric Acid Plant | R-7801 | Y | Heater/Boiler | Startup Heater | Existing | | | | Emission Factor | | | | 0.00 | | |
| #1 SRU Incinerator | H-1032 | Y | Heater/Boiler | Tail Gas Incinerator | Existing | 7 | 9,702 | 0 | Emission Factor | 1.86E-03 | 4.46E-02 | 0.01 | 0.00 | 0.00 | - |
| #2 SRU Incinerator | H-1042 | Y | Heater/Boiler | Tail Gas Incinerator | Existing | 15 | 73,434 | 0 | Emission Factor | 1.86E-03 | 4.46E-02 | 0.07 | 0.03 | 0.03 | - |
| #1 Beavon | H-1061 | Y | TGTU | Sulfur Recovery Units, Tail gas treatment | Existing | 10 | 0 | 0 | Emission Factor | | | | 0.00 | 0.00 | [B] |
| #2 Beavon | H-4761 | Y | TGTU | Tail Gas Treatment | Existing | 10 | 0 | 0 | Emission Factor | | | | 0.00 | 0.00 | [B] |
| East Incinerator | H-4745 | Y | Heater/Boiler | Tail Gas Incinerator | Existing | 55 | 142,237 | 0 | Emission Factor | 1.86E-03 | 4.46E-02 | 0.13 | 0.07 | 0.07 | - |
| Delayed Coker Unit | H-8501A | Y | Heater/Boiler | Coker process heater 1 | Existing | 200 | 2,480,262 | 0 | Emission Factor | 7.50E-04 | | 0.93 | 0.47 | 0.47 | - |
| Delayed Coker | H-8501B | Y | Heater/Boiler | Coker process heater | Existing | 200 | 2,472,154 | 0 | Emission Factor | 8.33E-04 | | 1.03 | 0.52 | 0.52 | - |
| Utility II | #5 Boiler (B-1155) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 539 | 1,765,918 | 811,841 | Emission Factor | 1.86E-03 | 4.46E-02 | 19.74 | 9.86 | 9.86 | [D] |
| Utility III | #6 Boiler (B-3301) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 257 | 1,271,145 | 480,095 | Emission Factor | 1.86E-03 | 4.46E-02 | 11.88 | 5.95 | 5.94 | [D], [E] |
| Utility III | #7 Boiler (B-3302) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 257 | 1,133,369 | 511,268 | Emission Factor | 1.86E-03 | 4.46E-02 | 12.45 | 6.23 | 6.22 | [D], [E] |
| Utility III | #8 Boiler (B-3303) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 512 | 2,503,750 | 1,163,089 | Emission Factor | 1.86E-03 | 4.46E-02 | 28.25 | 14.22 | 14.22 | [D] |
| Utility III | #9 Boiler (B-3304) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 512 | 1,976,231 | 977,844 | Emission Factor | 1.86E-03 | 4.46E-02 | 23.63 | 11.88 | 11.88 | [D] |
| Utility III | #10 Boiler (B-3701) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 225 | 1,532,157 | 0 | Emission Factor | 1.86E-03 | 4.46E-02 | 1.43 | 0.71 | 0.71 | - |
| Powerhouse 2 | GT No. 4 (G-3404) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 317 | 3,609,299 | 428,205 | Emission Factor | 1.90E-03 | 4.30E-03 | 4.35 | 2.17 | 2.17 | - |
| Powerhouse 2 | GT No. 5 (G-3405) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 317 | 3,657,276 | 201,966 | Emission Factor | 1.90E-03 | 4.30E-03 | 3.91 | 1.95 | 1.95 | - |
| Powerhouse 2 | GT No. 7 (G-3407) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 317 | 3,981,360 | 474,168 | Emission Factor | 1.90E-03 | 4.30E-03 | 4.80 | 2.40 | 2.40 | - |
| Powerhouse 2 | GT No. 8 (G-3408) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 392 | 1,787,553 | 506,126 | Emission Factor | 1.90E-03 | 4.30E-03 | 2.79 | 1.39 | 1.39 | - |

## Table C-7 Summary of Combustion Units PM BAE

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate/6-Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Powerhouse 2 | GT No. 9 (G-3409) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 304 | 4,439,104 | 280,162 | Emission Factor | 1.90E-03 | 4.30E-03 | 4.82 | 2.41 | 2.41 | |
| Powerhouse 2 | GT No. 10 (G-3410) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 325 (5) | 3,551,385 | 207,405 | Emission Factor | 1.90E-03 | 4.30E-03 | 3.82 | 1.91 | 1.91 | |
| GT No. 13 and Duct Burner | GT No. 13 (G-3413) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 626 | 5,968,643 | 546,683 | Emission Factor | See Note [C] | | 14.05 | 7.03 | 7.03 | [C] |
| GT No. 13 and | H-3413 | Y | Heater/Boiler | Duct Burner; | Existing | | | | Emission Factor | | | | | | |
| | | | | | | | | | | | | Total tpy | 141.69 | 141.68 | |

Notes: "-" indicates no adjustments to the BAE were required.

[A] Conservatively assumed zero contribution to the BAE used to set the proposed PAL.

[B] Beavons are not a source of particulate emissions

[C] Values obtained from hourly emissions data. Emission factors for firing scenarios provided below.

| Emission Factors (lb | | Gas w/DB | ;as w/o D | Oil w/DB |
|---|---|---|---|---|
| | PM | 0.01 | 0.0046 | 0.0129 |
| | PM10 | 0.0164 | 0.0082 | 0.016 |

[D] Distillate/6-Oil emission factor is presented as average for the 2009-2010 period. The emission factor is based on the sulfur content of the oil which varies slightly between 2009 and 2010.

[E] Emissions were downwardly adjusted for fuel oil usage of 35 barrels (bbls) above the combined 800 bbls/day limit for Boilers 6 & 7. Adjustment assumes equal firing rate for Boilers 6 & 7.

**Table C-8 Summary of Non-Combustion Units PM BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Emission Calculation Parameter | Baseline Period 24 Month Parameter Total | Units | Emission Factor/Method | Emission Factor Units | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #2 Platformer | #2 Plat Vent | Y | Process | Plat No. 2 Catalyst Regen Vent | Existing | Operation | 4,135 | hrs | 0.02 | lb/hr | 0.04 | 0.02 | 0.02 | - |
| #3 Platformer | #3 Plat Vent | Y | Process | Plat No. 3 Catalyst Regen Vent | Existing | Operation | 12,829 | hrs | 0.03 | lb/hr | 0.22 | 0.11 | 0.11 | - |
| #4 Platformer | #4 Plat Vent | Y | Process | Plat No. 4 Catalyst Regen Vent | Existing | Operation | 11,661 | hrs | 0.03 | lb/hr | 0.20 | 0.10 | 0.10 | - |
| FCCU | STK-7051 | Y | WGS | Fluid Catalytic Cracking | Existing | Coke Burn | 1,125,834 | Mlbs | 3.40E-02 | lb/Mlbs Coke Burn | 19.14 | 9.57 | 9.57 | - |
| FCCU Catalyst | FCCU Catalyst | Y | Fugitive PM | Fluid Catalytic Cracking | Existing | Cat Load | 23,271,014 | lbs | 0.04542 | lb/ton material load | 0.07 | 0.03 | 0.03 | [A] |
| Sulfuric Acid Plant | STK-7802 | Y | Process | Process Stack | Existing | | | | | | | 0.00 | 0.00 | [B] |
| # 1 Beavon | Beavon CT #1 | Y | Fugitive PM | Beavon CT #1 | Existing | Throughput | 9,084,960,000 | Gals | TDS/Drift | | 284.59 | 142.30 | 142.30 | [C] |
| # 2 Beavon | Beavon CT #2 | Y | Fugitive PM | Beavon CT #2 | Existing | Throughput | 9,081,180,000 | Gals | TDS/Drift | | 222.08 | 111.04 | 111.04 | [C] |
| West Sulfur Storage Area | Materials Handling | Y | Fugitive PM | Materials Handling | Existing | Material transferred | 91,127 | tons | 0.0137 | lb/ton material trans | 1.88 | 0.94 | 0.94 | [D] |
| East Sulfur Storage Area | Materials Handling | Y | Fugitive PM | Materials Handling | Existing | Material transferred | 148,728 | tons | 0.0137 | lb/ton material trans | 3.44 | 1.72 | 1.72 | [D] |
| Refinery Flare System | #2 Flare (H-1105) | Y | Flare | Gas burner | Existing | Heat Release | 3,163,635 | MMBtu | 1.86E-03 | lb/MMBtu | 2.95 | 1.47 | 1.47 | - |
| Refinery Flare System | #3 Flare (H-1104) | Y | Flare | Gas burner | Existing | Heat Release | 1,574,064 | MMBtu | 1.86E-03 | lb/MMBtu | 1.47 | 0.73 | 0.73 | - |
| Refinery Flare System | #5 Flare (H-3351) | Y | Flare | Gas burner | Existing | Heat Release | 2,291,870 | MMBtu | 1.86E-03 | lb/MMBtu | 2.13 | 1.07 | 1.07 | - |
| Refinery Flare System | #6 Flare (H-3352) | Y | Flare | Gas burner | Existing | Heat Release | 1,134,206 | MMBtu | 1.86E-03 | lb/MMBtu | 1.06 | 0.53 | 0.53 | - |
| Refinery Flare System | #7 Flare (H-3301) | Y | Flare | Gas burner | Existing | Heat Release | 3,730,347 | MMBtu | 1.86E-03 | lb/MMBtu | 3.47 | 1.74 | 1.74 | - |
| Refinery Flare System | LPG Flare (STK 7921) | Y | Flare | Gas burner, steam assisted | Existing | Heat Release | 0 | MMBtu | 1.86E-03 | lb/MMBtu | 0.00 | 0.00 | 0.00 | - |
| Refinery Flare System | FCC Flare (L.P. Flare - STK 7941) | Y | Flare | Gas burner, steam assisted | Existing | Heat Release | 2,541,561 | MMBtu | 1.86E-03 | lb/MMBtu | 2.37 | 1.18 | 1.18 | - |
| Refinery Flare System | Ground Flare (H.P. Flare - STK 7942) | Y | Flare | Gas burner | Existing | Heat Release | 451,355 | MMBtu | 1.86E-03 | lb/MMBtu | 0.42 | 0.21 | 0.21 | - |
| Delayed Coker Unit | TK-8501 | Y | Tank Fug | Fixed roof storage tank (pitch) | Existing | | | | AP-42 | | | 0.04 | 0.04 | [I] |

## Table C-8 Summary of Non-Combustion Units PM BAE

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Emission Calculation Parameter | Baseline Period 24 Month Parameter Total | Units | Emission Factor/Method | Emission Factor Units | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Coker Complex | Coke handling, storage, and loading system | Y | Fugitive PM | Transportation and breaking of solid coke between drums and dock | Existing | Throughput | 2,144,901 | tons coke | | | 14.55 | 7.27 | 7.27 | [H] |
| Coker Complex | Delayed Coker Steam Vent | Y | Process | Delayed Coker Steam Vent | Existing | Drum Vent Ep | 1,442 | Episodes | 61.6 | lbs/episode | 44.41 | 22.21 | 11.86 | [G] |
| Storage pile and conveyor | Storage pile and conveyor | Y | Fugitive PM | Sulfur storage and | Existing | Material transferred | 212,773 | tons | 0.0137 | lb/ton material trans | 6.15 | 3.08 | 3.08 | [D] |
| Roads | Roads | Y | Fugitive PM | Road Traffic | Existing | VMT | 1,825,000 | Miles | 0.046 | lb/VMT | 42.18 | 21.09 | 21.09 | [E] |
| Fire Training | Fire Training | Y | Flare | Fire Training | Existing | Fuel Usage | 48,778 | lbs | 0.13 | lb/lb fuel | 3.12 | 1.56 | 1.56 | [F] |
| | | | | | Total tpy | | | | | | | 328.01 | 317.66 | |

Notes: "-" indicates no adjustments to the BAE were required.

[A] FCCU catalyst loading emissions calculated using AP-42 Section 13.2.4.3. Emissions are from hopper loading, reactor loading, and reactor dumping. 50% control efficiency assumed for reactor loading and dumping. .

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| PM Emissions= | 3.54E+06 | lbs hopper load | | ton | 0.04542 | lb PM | |
| | | baseline | 2000 | lbs | | ton load | |
| + | 3.54E+06 | lbs reactor load | | ton | 0.04542 | lb PM | 0.5 |
| | | baseline | 2000 | lbs | | ton load | |
| + | 2.94E+06 | lbs reactor dump | | ton | 0.04542 | lb PM | 0.5 |
| | | baseline | 2000 | lbs | | ton load | |
| = | 1.54E+02 | lbs PM | | | | | |
| = | 7.70E-02 | tons PM | | | | | |

[B] Sulfuric Acid Plant process stack is not a source of PM emissions

[C] Cooling tower PM emissions calculated using the following equation

PM lbs = (Water throughput) x (8.34 lb/gal) x (Drift Loss Factor) x (Cooling Water TDS) / (1,000,000)

PM tons =PM lbs/2000 lbs per ton

[D] PM emissions calculated using AP-42 Section 13.2.4.3. Emissions from East and West sulfur storage are from drop from conveyor, truck loading, and wind erosion. Emissions from are from truck unloading, conveyor loading ship loading, and wind erosion.

Example Calc:

| | | | | |
|---|---|---|---|---|
| West Side Baseline Total PM | 9.11E+04 | tons conveyor c | 0.0137 | lb PM |
| | | baseline | | ton load |
| + | 9.11E+04 | truck loading | 0.0137 | lb PM |
| | | baseline | | ton load |
| + | 1.00 | acre | 3.5 | lb PM |
| | | West Side | | acre/day |

## Table C-8  Summary of Non-Combustion Units PM BAE

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Emission Calculation Parameter | Baseline Period 24 Month Parameter Total | Units | Emission Factor/Method | Emission Factor Units | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

= 3.77E+03 lbs PM
= 1.88 tons PM

[E] VMT = vehicle miles travelled.  Calculation reference:  AP-42 Chapter 13.2
[F] Emission factors for fire traing (JP-4) per "Calculation Methods for Criteria Air Pollutant Emission Inventories", Brooks Air Force Base, TX, July 1994
[G] PM BAE from the delayed coker vent were downwardly adjusted to comply with 2 psig depressurization standard in Consent Decree.
[H] Estimates based on AP-42, Chapter 13.2.4, Equation 1.  See Appendix B of this application for calculation methodology.
[I] Estimates based on AP-42, Chapter 11.1.   See Appendix B of this application for calculation methodology.

## Table C-9 Summary of Combustion Units PM10 BAE

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate/6-Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #2 DU Fractionator | H-101 | Y | Heater/Boiler | Heater | Existing | 146 | 791,295 | 43,469 | Emission Factor | 7.45E-03 | 5.47E-02 | 4.14 | 2.06 | 2.06 | [D] |
| #2 DU Fractionator | H-104 | Y | Heater/Boiler | Heater | Existing | 108 | 654,318 | 40,043 | Emission Factor | 7.45E-03 | 5.47E-02 | 3.53 | 1.76 | 1.76 | [D] |
| #2 CDU | H-401A | Y | Heater/Boiler | Charge Heater | Existing | 171 | 828,797 | 257,804 | Emission Factor | 7.45E-03 | 5.47E-02 | 10.14 | 5.08 | 5.08 | [D] |
| #2 CDU | H-401B | Y | Heater/Boiler | Charge Heater | Existing | 171 | 828,797 | 257,804 | Emission Factor | 7.45E-03 | 5.47E-02 | 10.14 | 5.08 | 5.08 | [D] |
| #2 CDU | H-401C | Y | Heater/Boiler | Charge Heater | Existing | 171 | 828,797 | 257,804 | Emission Factor | 7.45E-03 | 5.47E-02 | 10.14 | 5.08 | 5.08 | [D] |
| #3 DD | C-1500A | Y | Compressor | Reciprocating Gas Compressor | Existing | 3 | 15,104 | 0 | Emission Factor | 1.94E-02 | | 0.15 | 0.07 | 0.07 | - |
| #3 DD | C-1500B | Y | Compressor | Reciprocating Gas Compressor | Existing | 3 | 15,104 | 0 | Emission Factor | 1.94E-02 | | 0.15 | 0.07 | 0.07 | - |
| #3 DD | C-1500C | Y | Compressor | Reciprocating Gas Compressor | Existing | 3 | 15,104 | 0 | Emission Factor | 1.94E-02 | | 0.15 | 0.07 | 0.07 | - |
| Penex | H-200 | Y | Heater/Boiler | Charge Heater | Existing | 37 | 389,579 | 0 | Emission Factor | 7.45E-03 | | 1.45 | 0.73 | 0.73 | - |
| Penex | H-201 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 37 | 395,352 | 0 | Emission Factor | 7.45E-03 | | 1.47 | 0.74 | 0.74 | - |
| Penex | H-202 | Y | Heater/Boiler | Hot Oil Heater | Existing | 122 | 874,691 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 3.26 | 1.63 | 1.63 | - |
| Penex | C-200A | Y | Compressor | Reciprocating Gas Compressor | Existing | 9 | 75,121 | 0 | Emission Factor | 1.94E-02 | | 0.73 | 0.36 | 0.36 | - |
| Penex | C-200B | Y | Compressor | Reciprocating Gas Compressor | Existing | 9 | 75,121 | 0 | Emission Factor | 1.94E-02 | | 0.73 | 0.36 | 0.36 | - |
| Penex | C-200C | Y | Compressor | Reciprocating Gas Compressor | Existing | 9 | 75,121 | 0 | Emission Factor | 1.94E-02 | | 0.73 | 0.36 | 0.36 | - |
| Utility Fractionation | H-160 | Y | Heater/Boiler | Charge Heater | Existing | 135 | 884,143 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 3.29 | 1.65 | 1.65 | - |
| #2 Platformer | H-601 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 36 | 221,021 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 0.82 | 0.41 | 0.41 | - |
| #2 Platformer | H-604 | Y | Heater/Boiler | Platforming No. 2 Interheater | Existing | 37 | 214,990 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 0.80 | 0.40 | 0.40 | - |
| #2 Platformer | H-605 | Y | Heater/Boiler | Platforming No. 3 Interheater | Existing | 15 | 59,776 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 0.22 | 0.11 | 0.11 | - |
| #2 DU | H-800A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 43 | 461,566 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 1.72 | 0.86 | 0.86 | - |
| #2 DU | H-800B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 43 | 441,880 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 1.65 | 0.82 | 0.82 | - |
| #2 DU | H-801 | Y | Heater/Boiler | Stripper Heater | Existing | 101 | 803,114 | 0 | Emission Factor | 7.45E-03 | | 2.99 | 1.50 | 1.50 | - |
| #4 DD | H-2201A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 61 | 690,666 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 2.57 | 1.29 | 1.29 | - |
| #4 DD | H-2201B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 61 | 690,666 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 2.57 | 1.29 | 1.29 | - |

## Table C-9 Summary of Combustion Units PM10 BAE

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate/6-Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #4 DD | H-2202 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 119 | 980,002 | 0 | Emission Factor | 7.45E-03 | | 3.65 | 1.83 | 1.83 | - |
| #5 DD | H-2400 | Y | Heater/Boiler | Charge Heater | Existing | 33 | 463,511 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 1.73 | 0.86 | 0.86 | - |
| #5 DD | C-2400A | Y | Compressor | Reciprocating Gas Compressor | Existing | 7 | 48,723 | 0 | Emission Factor | 1.94E-02 | | 0.47 | 0.24 | 0.24 | - |
| #5 DD | C-2400B | Y | Compressor | Reciprocating Gas Compressor | Existing | 7 | 48,723 | 0 | Emission Factor | 1.94E-02 | | 0.47 | 0.24 | 0.24 | - |
| Naphtha Fractionation | H-2501 | Y | Heater/Boiler | Reboiler Heater | Existing | 203 | 437,565 | 0 | Emission Factor | 7.45E-03 | | 1.63 | 0.82 | 0.82 | - |
| #2 Sulfolane | H-4502 | Y | Heater/Boiler | Benzene Column Reboiler Heater | Existing | 149 | 858,943 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 3.20 | 1.60 | 1.60 | - |
| #2 Sulfolane | H-4503 | Y | Heater/Boiler | Toluene Column Reboiler Heater | Existing | 141 | 753,962 | 0 | Emission Factor | 7.45E-03 | | 2.81 | 1.40 | 1.40 | - |
| #2 Sulfolane | H-4504 | Y | Heater/Boiler | Xylene Column Reboiler Heater | Existing | 126 | 607,009 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 2.26 | 1.13 | 1.13 | - |
| #2 Sulfolane | H-4505 | Y | Heater/Boiler | Raffinate Splitter Reboiler Heater | Existing | 109 | 470,895 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 1.75 | 0.88 | 0.88 | - |
| #5 CDU | H-3101A | Y | Heater/Boiler | Crude Charge Heater | Existing | 381 | 2,184,815 | 614,217 | Emission Factor | 7.45E-03 | 5.47E-02 | 24.94 | 12.47 | 12.47 | [D] |
| #5 CDU | H-3101B | Y | Heater/Boiler | Crude Charge Heater | Existing | 381 | 2,436,185 | 659,430 | Emission Factor | 7.45E-03 | 5.47E-02 | 27.11 | 13.54 | 13.54 | [D] |
| #6 CDU | H-4101A | Y | Heater/Boiler | Crude Charge Heater | Existing | 381 | 2,446,267 | 516,409 | Emission Factor | 7.45E-03 | 5.47E-02 | 23.24 | 11.59 | 11.59 | [D] |
| #6 CDU | H-4101B | Y | Heater/Boiler | Crude Charge Heater | Existing | 381 | 2,817,416 | 557,900 | Emission Factor | 7.45E-03 | 5.47E-02 | 25.76 | 12.84 | 12.84 | [D] |
| #3 Platformer | H-4401 | Y | Heater/Boiler | Charge Heater | Existing | 134 | 1,025,393 | 0 | Emission Factor | 7.45E-03 | | 3.82 | 1.91 | 1.91 | - |
| #3 Platformer | H-4402 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 128 | 721,833 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 2.69 | 1.34 | 1.34 | - |
| #3 Platformer | H-4451 | Y | Heater/Boiler | Charge Heater | Existing | 381 | 2,918,945 | 0 | Emission Factor | 7.45E-03 | | 10.87 | 5.44 | 5.44 | - |
| #3 Platformer | H-4452 | Y | Heater/Boiler | Intermediate Heater | Existing | 248 | 1,803,863 | 0 | Emission Factor | 7.45E-03 | | 6.72 | 3.36 | 3.36 | - |
| #3 Platformer | H-4453 | Y | Heater/Boiler | Intermediate Heater | Existing | 248 | 1,338,392 | 0 | Emission Factor | 7.45E-03 | | 4.99 | 2.49 | 2.49 | - |
| #3 Platformer | H-4454 | Y | Heater/Boiler | Intermediate Heater | Existing | 77 | 518,276 | 0 | Emission Factor | 7.45E-03 | | 1.93 | 0.97 | 0.97 | - |
| #3 Platformer | H-4455 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 138 | 1,076,287 | 0 | Emission Factor | 7.45E-03 | | 4.01 | 2.00 | 2.00 | - |
| #3 VAC | H-4201 | Y | Heater/Boiler | Prestripper Heater | Existing | 253 | 1,195,811 | 545,534 | Emission Factor | 7.45E-03 | 5.47E-02 | 19.38 | 9.71 | 9.71 | [D] |
| #3 VAC | H-4202 | Y | Heater/Boiler | Vacuum Heater | Existing | 245 | 962,882 | 553,169 | Emission Factor | 7.45E-03 | 5.47E-02 | 18.72 | 9.37 | 9.37 | [D] |
| #4 Platformer | H-5401 | Y | Heater/Boiler | Charge Heater | Existing | 134 | 983,723 | 0 | Emission Factor | 7.45E-03 | | 3.66 | 1.83 | 1.83 | - |
| #4 Platformer | H-5402 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 128 | 684,930 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 2.55 | 1.28 | 1.28 | - |

**Table C-9 Summary of Combustion Units PM10 BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate/6-Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #4 Platformer | H-5451 | Y | Heater/Boiler | Charge Heater | Existing | 381 | 2,059,984 | 0 | Emission Factor | 7.45E-03 | | 7.67 | 3.84 | 3.84 | - |
| #4 Platformer | H-5452 | Y | Heater/Boiler | Intermediate Heater | Existing | 248 | 1,843,813 | 0 | Emission Factor | 7.45E-03 | | 6.87 | 3.43 | 3.43 | - |
| #4 Platformer | H-5453 | Y | Heater/Boiler | Intermediate Heater | Existing | 248 | 1,356,092 | 0 | Emission Factor | 7.45E-03 | | 5.05 | 2.53 | 2.53 | - |
| #4 Platformer | H-5454 | Y | Heater/Boiler | Intermediate Heater | Existing | 77 | 491,861 | 0 | Emission Factor | 7.45E-03 | | 1.83 | 0.92 | 0.92 | - |
| #4 Platformer | H-5455 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 138 | 1,014,968 | 0 | Emission Factor | 7.45E-03 | | 3.78 | 1.89 | 1.89 | - |
| #6 DD | H-4601A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 61 | 307,355 | 0 | Emission Factor | 7.45E-03 | | 1.15 | 0.57 | 0.57 | - |
| #6 DD | H-4601B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 61 | 306,150 | 0 | Emission Factor | 7.45E-03 | | 1.14 | 0.57 | 0.57 | - |
| #6 DD | H-4602 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 119 | 669,854 | 0 | Emission Factor | 7.45E-03 | | 2.50 | 1.25 | 1.25 | - |
| #6 DD | C-4601A | Y | Compressor | Reciprocating Gas Compressor | Existing | 21 | 86,488 | 0 | Emission Factor | 9.99E-03 | | 0.43 | 0.22 | 0.22 | - |
| #6 DD | C-4601B | Y | Compressor | Reciprocating Gas Compressor | Existing | 21 | 86,488 | 0 | Emission Factor | 9.99E-03 | | 0.43 | 0.22 | 0.22 | - |
| #6 DD | C-4601C | Y | Compressor | Reciprocating Gas Compressor | Existing | 21 | 86,488 | 0 | Emission Factor | 9.99E-03 | | 0.43 | 0.22 | 0.22 | - |
| #7 DD | H-4301A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 67 | 550,826 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 2.05 | 1.03 | 1.03 | - |
| #7 DD | H-4301B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 67 | 573,413 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 2.14 | 1.07 | 1.07 | - |
| #7 DD | H-4302 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 122 | 1,053,299 | 0 | Emission Factor | 7.45E-03 | | 3.92 | 1.96 | 1.96 | - |
| #9 DD | H-5301A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 67 | 471,591 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 1.76 | 0.88 | 0.88 | - |
| #9 DD | H-5301B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 67 | 449,346 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 1.67 | 0.84 | 0.84 | - |
| #9 DD | H-5302 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 122 | 1,257,163 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 4.68 | 2.34 | 2.34 | - |
| LSG Unit | H-4901 | Y | Heater/Boiler | Charge Heater | Existing | 87 | | | | | | | 0.00 | 0.00 | [A] |
| Sulfuric Acid Plant | STK-7801 | Y | Heater/Boiler | Heater Stack | Existing | 30 | 119,284 | 0 | Emission Factor | 1.10E-02 | | 0.66 | 0.33 | 0.33 | |
| Sulfuric Acid Plant | H-7801 | Y | Heater/Boiler | Process Air Heater | Existing | | | | Emission Factor | | | | 0.00 | | |
| Sulfuric Acid Plant | H-7802 | Y | Heater/Boiler | Converter Heater | Existing | | | | Emission Factor | | | | 0.00 | | |
| Sulfuric Acid Plant | R-7801 | Y | Heater/Boiler | Startup Heater | Existing | | | | Emission Factor | | | | 0.00 | | |
| #1 SRU Incinerator | H-1032 | Y | Heater/Boiler | Tail Gas Incinerator | Existing | 7 | 9,702 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 0.04 | 0.02 | 0.02 | - |

## Table C-9 Summary of Combustion Units PM10 BAE

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate/6-Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #2 SRU Incinerator | H-1042 | Y | Heater/Boiler | Tail Gas Incinerator | Existing | 15 | 73,434 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 0.27 | 0.14 | 0.14 | - |
| #1 Beavon | H-1061 | Y | TGTU | Sulfur Recovery Units, Tail gas treatment | Existing | 10 | 0 | 0 | Emission Factor | | | | 0.00 | 0.00 | [B] |
| #2 Beavon | H-4761 | Y | TGTU | Tail Gas Treatment | Existing | 10 | 0 | 0 | Emission Factor | | | | 0.00 | 0.00 | [B] |
| East Incinerator | H-4745 | Y | Heater/Boiler | Tail Gas Incinerator | Existing | 55 | 142,237 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 0.53 | 0.26 | 0.26 | |
| Delayed Coker Unit | H-8501A | Y | Heater/Boiler | Coker process heater 1 | Existing | 200 | 2,480,262 | 0 | Emission Factor | 4.70E-03 | | 5.83 | 2.91 | 2.91 | - |
| Delayed Coker | H-8501B | Y | Heater/Boiler | Coker process heater | Existing | 200 | 2,472,154 | 0 | Emission Factor | 2.25E-03 | | 2.78 | 1.39 | 1.39 | - |
| Utility II | #5 Boiler (B-1155) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 539 | 1,765,918 | 811,841 | Emission Factor | 7.45E-03 | 5.47E-02 | 28.78 | 14.39 | 14.39 | [D] |
| Utility III | #6 Boiler (B-3301) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 257 | 1,271,145 | 480,095 | Emission Factor | 7.45E-03 | 5.47E-02 | 17.87 | 8.94 | 8.94 | [D], [E] |
| Utility III | #7 Boiler (B-3302) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 257 | 1,133,369 | 511,268 | Emission Factor | 7.45E-03 | 5.47E-02 | 18.21 | 9.11 | 9.10 | [D], [E] |
| Utility III | #8 Boiler (B-3303) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 512 | 2,503,750 | 1,163,089 | Emission Factor | 7.45E-03 | 5.47E-02 | 41.14 | 20.66 | 20.66 | [D] |
| Utility III | #9 Boiler (B-3304) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 512 | 1,976,231 | 977,844 | Emission Factor | 7.45E-03 | 5.47E-02 | 34.11 | 17.12 | 17.12 | [D] |
| Utility III | #10 Boiler (B-3701) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 225 | 1,532,157 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 5.71 | 2.85 | 2.85 | - |
| Powerhouse 2 | GT No. 4 (G-3404) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 317 | 3,609,299 | 428,205 | Emission Factor | 6.60E-03 | 1.20E-02 | 14.48 | 7.24 | 7.24 | - |
| Powerhouse 2 | GT No. 5 (G-3405) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 317 | 3,657,276 | 201,966 | Emission Factor | 6.60E-03 | 1.20E-02 | 13.28 | 6.64 | 6.64 | - |
| Powerhouse 2 | GT No. 7 (G-3407) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 317 | 3,981,360 | 474,168 | Emission Factor | 6.60E-03 | 1.20E-02 | 15.98 | 7.99 | 7.99 | - |
| Powerhouse 2 | GT No. 8 (G-3408) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 392 | 1,787,553 | 506,126 | Emission Factor | 6.60E-03 | 1.20E-02 | 8.94 | 4.47 | 4.47 | - |
| Powerhouse 2 | GT No. 9 (G-3409) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 304 | 4,439,104 | 280,162 | Emission Factor | 6.60E-03 | 1.20E-02 | 16.33 | 8.17 | 8.17 | - |
| Powerhouse 2 | GT No. 10 (G-3410) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 325 (5) | 3,551,385 | 207,405 | Emission Factor | 6.60E-03 | 1.20E-02 | 12.96 | 6.48 | 6.48 | - |
| GT No. 13 and Duct Burner | GT No. 13 (G-3413) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 626 | 5,968,643 | 546,683 | Emission Factor | See Note [C] | | 22.45 | 11.22 | 11.22 | [C] |
| | | | | | | | | | | | | Total tpy | 285.01 | 285.01 | |

**Table C-9 Summary of Combustion Units PM10 BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate/6-Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

Notes: "-" indicates no adjustments to the BAE were required.

[A] Conservatively assumed zero contribution to the BAE used to set the proposed PAL.

[B] Beavons are not a source of particulate emissions

[C] Values obtained from hourly emissions data. Emission factors for firing scenarios provided below.

| Emission Factors (l | | Gas w/DB | ;as w/o D | Oil w/DB |
|---|---|---|---|---|
| | PM | 0.01 | 0.0046 | 0.0129 |
| | PM10 | 0.0164 | 0.0082 | 0.016 |

[D] Distillate/6-Oil emission factor is presented as average for the 2009-2010 period. The emission factor is based on the sulfur content of the oil which varies slightly between 2009 and 2010.

[E] Emissions were downwardly adjusted for fuel oil usage of 35 barrels (bbls) above the combined 800 bbls/day limit for Boilers 6 & 7. Adjustment assumes equal firing rate for Boilers 6 & 7.

**Table C-10 Summary of Non-Combustion Units PM10 BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Emission Calculation Parameter | Baseline Period 24 Month Parameter Total | Units | Emission Factor/Method | Emission Factor Units | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #2 Platformer | #2 Plat Vent | Y | Process | Plat No. 2 Catalyst Regen Vent | Existing | Operation | 4,135 | hrs | 0.0190 | lb/hr | 0.04 | 0.02 | 0.02 | - |
| #3 Platformer | #3 Plat Vent | Y | Process | Plat No. 3 Catalyst Regen Vent | Existing | Operation | 12,829 | hrs | 0.0343 | lb/hr | 0.22 | 0.11 | 0.11 | - |
| #4 Platformer | #4 Plat Vent | Y | Process | Plat No. 4 Catalyst Regen Vent | Existing | Operation | 11,661 | hrs | 0.0343 | lb/hr | 0.20 | 0.10 | 0.10 | - |
| FCCU | STK-7051 | Y | WGS | Fluid Catalytic Cracking | Existing | Coke Burn | 1,125,834 | Mlbs | 0.312 | b/Mlbs Coke Burr | 175.62 | 87.81 | 87.81 | |
| FCCU Catalyst | FCCU Catalyst | Y | Fugitive PM | Fluid Catalytic Cracking | Existing | Cat Load | 23,271,014 | lbs | 0.0454 | b/ton material loa | 0.07 | 0.03 | 0.03 | [A] |
| Sulfuric Acid Plant | STK-7802 | Y | Process | Process Stack | Existing | | | | | | | 0.00 | 0.00 | [B] |
| # 1 Beavon | Beavon CT #1 | Y | Fugitive PM | Beavon CT #1 | Existing | Throughput | 9,084,960,000 | Gals | TDS/Drift | | 0.61 | 0.31 | 0.31 | [C] |
| # 2 Beavon | Beavon CT #2 | Y | Fugitive PM | Beavon CT #2 | Existing | Throughput | 9,081,180,000 | Gals | TDS/Drift | | 0.48 | 0.24 | 0.24 | [C] |
| West Sulfur Storage Area | Materials Handling | Y | Fugitive PM | Materials Handling | Existing | laterial transferre | 91,127 | tons | 0.0065 | b/ton material tran | 1.23 | 0.61 | 0.61 | [D] |
| East Sulfur Storage Area | Materials Handling | Y | Fugitive PM | Materials Handling | Existing | laterial transferre | 148,728 | tons | 0.0065 | b/ton material tran | 2.37 | 1.18 | 1.18 | [D] |
| Refinery Flare System | #2 Flare (H-1105) | Y | Flare | Gas burner | Existing | Heat Release | 3,163,635 | MMBtu | 0.0075 | lb/MMBtu | 11.79 | 5.89 | 5.89 | - |
| Refinery Flare System | #3 Flare (H-1104) | Y | Flare | Gas burner | Existing | Heat Release | 1,574,064 | MMBtu | 0.0075 | lb/MMBtu | 5.86 | 2.93 | 2.93 | - |
| Refinery Flare System | #5 Flare (H-3351) | Y | Flare | Gas burner | Existing | Heat Release | 2,291,870 | MMBtu | 0.0075 | lb/MMBtu | 8.54 | 4.27 | 4.27 | - |
| Refinery Flare System | #6 Flare (H-3352) | Y | Flare | Gas burner | Existing | Heat Release | 1,134,206 | MMBtu | 0.0075 | lb/MMBtu | 4.23 | 2.11 | 2.11 | - |
| Refinery Flare System | #7 Flare (H-3301) | Y | Flare | Gas burner | Existing | Heat Release | 3,730,347 | MMBtu | 0.0075 | lb/MMBtu | 13.90 | 6.95 | 6.95 | - |
| Refinery Flare System | LPG Flare (STK 7921) | Y | Flare | Gas burner, steam assisted | Existing | Heat Release | 0 | MMBtu | 0.0075 | lb/MMBtu | 0.00 | | | |
| Refinery Flare System | FCC Flare (L.P. Flare - STK 7941) | Y | Flare | Gas burner, steam assisted | Existing | Heat Release | 2,541,561 | MMBtu | 0.0075 | lb/MMBtu | 9.47 | 4.73 | 4.73 | - |
| Refinery Flare System | Ground Flare (H.P. Flare - STK 7942) | Y | Flare | Gas burner | Existing | Heat Release | 451,355 | MMBtu | 0.0075 | lb/MMBtu | 1.68 | 0.84 | 0.84 | - |
| Delayed Coker Unit | TK-8501 | Y | Tank Fug | Fixed roof storage tank (pitch) | Existing | | | | | | | 0.04 | 0.04 | [I] |
| Coker Complex | Coke handling, storage, and loading system | Y | Fugitive PM | Transportation and breaking of solid coke between drums and dock | Existing | Throughput | 2,144,901 | tons coke | | | 12.56 | 6.28 | 6.28 | [H] |
| Coker Complex | Delayed Coker Steam Vent | Y | Process | Delayed Coker Steam Vent | Existing | r Drum Vent Epis | 1,442 | Episodes | 61.6000 | lbs/episode | 44.41 | 22.21 | 11.86 | [G] |
| Storage pile and conveyor | Storage pile and conveyor | Y | Fugitive PM | Sulfur storage and | Existing | laterial transferre | 212,773 | tons | 0.0065 | b/ton material tran | 3.85 | 1.93 | 1.93 | [D] |
| Roads | Roads | Y | Fugitive PM | Road Traffic | Existing | VMT | 1,825,000 | Miles | 0.0092 | lb/VMT | 8.44 | 4.22 | 4.22 | [E] |
| Fire Training | Fire Training | Y | Flare | Fire Training | Existing | Fuel Usage | 48,778 | lbs | 0.1280 | lb/lb fuel | 3.122 | 1.56 | 1.56 | [F] |
| | | | | | | | | | | | Total (tpy) | 154 | 144 | |

**Table C-10 Summary of Non-Combustion Units PM10 BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Emission Calculation Parameter | Baseline Period 24 Month Parameter Total | Units | Emission Factor/Method | Emission Factor Units | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

Notes: "-" indicates no adjustments to the BAE were required.

[A] FCCU catalyst loading emissions calculated using AP-42 Section 13.2.4.3. Emissions are from hopper loading, reactor loading, and reactor dumping. 50% control efficiency assumed for reactor loading and dumping. .

PM Emissions=

| | | | | | | |
|---|---|---|---|---|---|---|
| 3.54E+06 | lbs hopper load | | ton | 0.04542 | lb PM | |
| | baseline | 2000 | lbs | | ton load | |

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| | | | | | | |
|---|---|---|---|---|---|---|
| 3.54E+06 | lbs reactor load | | ton | 0.04542 | lb PM | 0.5 |
| | baseline | 2000 | lbs | | ton load | |

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| | | | | | | |
|---|---|---|---|---|---|---|
| 2.94E+06 | lbs reactor dump | | ton | 0.04542 | lb PM | 0.5 |
| | baseline | 2000 | lbs | | ton load | |

= 1.54E+02 lbs PM

= 7.70E-02 tons PM

[B] Sulfuric Acid Plant process stack is not a source of PM emissions

[C] Cooling tower PM emissions calculated using the following equation

PM lbs = (Water throughput) x (8.34 lb/gal) x (Drift Loss Factor) x (Cooling Water TDS) / (1,000,000)

PM tons =PM lbs/2000 lbs per ton

PM10 fraction determined to be 0.2% using Reisman & Frisbie wet droplet size distribution methodology in "Calculating Realistic PM10 Emissions from Cooling Towers".

[D] PM emissions calculated using AP-42 Section 13.2.4.3. Emissions from East and West sulfur storage are from drop from conveyor, truck loading, and wind erosion. Emissions from are from truck unloading, conveyor loading ship loading, and wind

Example Calc:

West Side Baseline Total PM Emissions=

| | | | |
|---|---|---|---|
| 9.11E+04 | tons conveyor dr | 0.0065 | lb PM |
| | baseline | | ton load |

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| | | | |
|---|---|---|---|
| 9.11E+04 | truck loading | 0.0065 | lb PM |
| | baseline | | ton load |

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| | | | |
|---|---|---|---|
| 1.00 | acre | 3.5 | lb PM |
| | West Side | | acre/day |

= 2.45E+03 lbs PM

= 1.23 tons PM

[E] VMT = vehicle miles travelled. Calculation reference: AP-42 Chapter 13.2

[F] Emission factors for fire traing (JP-4) per "Calculation Methods for Criteria Air Pollutant Emission Inventories", Brooks Air Force Base, TX, July 1994

[G] PM BAE from the delayed coker vent were downwardly adjusted to comply with 2 psig depressurization standard in Consent Decree.

[H] Estimates based on AP-42, Chapter 13.2.4, Equation 1. See Appendix B of this application for calculation methodology.

[I] Estimates based on AP-42, Chapter 13.2.4, Equation 1. See Appendix B of this application for calculation methodology.

**Table C-11 Summary of Combustion Units PM2.5 BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate/6-Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #2 DU Fractionator | H-101 | Y | Heater/Boiler | Heater | Existing | 146 | 791,295 | 43,469 | Emission Factor | 7.45E-03 | 5.47E-02 | 4.14 | 2.06 | 2.06 | [D] |
| #2 DU Fractionator | H-104 | Y | Heater/Boiler | Heater | Existing | 108 | 654,318 | 40,043 | Emission Factor | 7.45E-03 | 5.47E-02 | 3.53 | 1.76 | 1.76 | [D] |
| #2 CDU | H-401A | Y | Heater/Boiler | Charge Heater | Existing | 171 | 828,797 | 257,804 | Emission Factor | 7.45E-03 | 5.47E-02 | 10.14 | 5.08 | 5.08 | [D] |
| #2 CDU | H-401B | Y | Heater/Boiler | Charge Heater | Existing | 171 | 828,797 | 257,804 | Emission Factor | 7.45E-03 | 5.47E-02 | 10.14 | 5.08 | 5.08 | [D] |
| #2 CDU | H-401C | Y | Heater/Boiler | Charge Heater | Existing | 171 | 828,797 | 257,804 | Emission Factor | 7.45E-03 | 5.47E-02 | 10.14 | 5.08 | 5.08 | [D] |
| #3 DD | C-1500A | Y | Compressor | Reciprocating Gas Compressor | Existing | 3 | 15,104 | 0 | Emission Factor | 1.94E-02 | | 0.15 | 0.07 | 0.07 | - |
| #3 DD | C-1500B | Y | Compressor | Reciprocating Gas Compressor | Existing | 3 | 15,104 | 0 | Emission Factor | 1.94E-02 | | 0.15 | 0.07 | 0.07 | - |
| #3 DD | C-1500C | Y | Compressor | Reciprocating Gas Compressor | Existing | 3 | 15,104 | 0 | Emission Factor | 1.94E-02 | | 0.15 | 0.07 | 0.07 | - |
| Penex | H-200 | Y | Heater/Boiler | Charge Heater | Existing | 37 | 389,579 | 0 | Emission Factor | 7.45E-03 | | 1.45 | 0.73 | 0.73 | - |
| Penex | H-201 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 37 | 395,352 | 0 | Emission Factor | 7.45E-03 | | 1.47 | 0.74 | 0.74 | - |
| Penex | H-202 | Y | Heater/Boiler | Hot Oil Heater | Existing | 122 | 874,691 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 3.26 | 1.63 | 1.63 | - |
| Penex | C-200A | Y | Compressor | Reciprocating Gas Compressor | Existing | 9 | 75,121 | 0 | Emission Factor | 1.94E-02 | | 0.73 | 0.36 | 0.36 | - |
| Penex | C-200B | Y | Compressor | Reciprocating Gas Compressor | Existing | 9 | 75,121 | 0 | Emission Factor | 1.94E-02 | | 0.73 | 0.36 | 0.36 | - |
| Penex | C-200C | Y | Compressor | Reciprocating Gas Compressor | Existing | 9 | 75,121 | 0 | Emission Factor | 1.94E-02 | | 0.73 | 0.36 | 0.36 | - |
| Utility Fractionation | H-160 | Y | Heater/Boiler | Charge Heater | Existing | 135 | 884,143 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 3.29 | 1.65 | 1.65 | - |
| #2 Platformer | H-601 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 36 | 221,021 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 0.82 | 0.41 | 0.41 | - |

**Table C-11  Summary of Combustion Units PM2.5 BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate/6-Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #2 Platformer | H-604 | Y | Heater/Boiler | Platforming No. 2 Interheater | Existing | 37 | 214,990 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 0.80 | 0.40 | 0.40 | - |
| #2 Platformer | H-605 | Y | Heater/Boiler | Platforming No. 3 Interheater | Existing | 15 | 59,776 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 0.22 | 0.11 | 0.11 | - |
| #2 DU | H-800A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 43 | 461,566 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 1.72 | 0.86 | 0.86 | - |
| #2 DU | H-800B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 43 | 441,880 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 1.65 | 0.82 | 0.82 | - |
| #2 DU | H-801 | Y | Heater/Boiler | Stripper Heater | Existing | 101 | 803,114 | 0 | Emission Factor | 7.45E-03 | | 2.99 | 1.50 | 1.50 | - |
| #4 DD | H-2201A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 61 | 690,666 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 2.57 | 1.29 | 1.29 | - |
| #4 DD | H-2201B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 61 | 690,666 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 2.57 | 1.29 | 1.29 | - |
| #4 DD | H-2202 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 119 | 980,002 | 0 | Emission Factor | 7.45E-03 | | 3.65 | 1.83 | 1.83 | - |
| #5 DD | H-2400 | Y | Heater/Boiler | Charge Heater | Existing | 33 | 463,511 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 1.73 | 0.86 | 0.86 | - |
| #5 DD | C-2400A | Y | Compressor | Reciprocating Gas Compressor | Existing | 7 | 48,723 | 0 | Emission Factor | 1.94E-02 | | 0.47 | 0.24 | 0.24 | - |
| #5 DD | C-2400B | Y | Compressor | Reciprocating Gas Compressor | Existing | 7 | 48,723 | 0 | Emission Factor | 1.94E-02 | | 0.47 | 0.24 | 0.24 | - |
| Naphtha Fractionation | H-2501 | Y | Heater/Boiler | Reboiler Heater | Existing | 203 | 437,565 | 0 | Emission Factor | 7.45E-03 | | 1.63 | 0.82 | 0.82 | - |
| #2 Sulfolane | H-4502 | Y | Heater/Boiler | Benzene Column Reboiler Heater | Existing | 149 | 858,943 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 3.20 | 1.60 | 1.60 | - |
| #2 Sulfolane | H-4503 | Y | Heater/Boiler | Toluene Column Reboiler Heater | Existing | 141 | 753,962 | 0 | Emission Factor | 7.45E-03 | | 2.81 | 1.40 | 1.40 | - |

## Table C-11 Summary of Combustion Units PM2.5 BAE

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate/6-Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #2 Sulfolane | H-4504 | Y | Heater/Boiler | Xylene Column Reboiler Heater | Existing | 126 | 607,009 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 2.26 | 1.13 | 1.13 | - |
| #2 Sulfolane | H-4505 | Y | Heater/Boiler | Raffinate Splitter Reboiler Heater | Existing | 109 | 470,895 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 1.75 | 0.88 | 0.88 | - |
| #5 CDU | H-3101A | Y | Heater/Boiler | Crude Charge Heater | Existing | 381 | 2,184,815 | 614,217 | Emission Factor | 7.45E-03 | 5.47E-02 | 24.94 | 12.47 | 12.47 | [D] |
| #5 CDU | H-3101B | Y | Heater/Boiler | Crude Charge Heater | Existing | 381 | 2,436,185 | 659,430 | Emission Factor | 7.45E-03 | 5.47E-02 | 27.11 | 13.54 | 13.54 | [D] |
| #6 CDU | H-4101A | Y | Heater/Boiler | Crude Charge Heater | Existing | 381 | 2,446,267 | 516,409 | Emission Factor | 7.45E-03 | 5.47E-02 | 23.24 | 11.59 | 11.59 | [D] |
| #6 CDU | H-4101B | Y | Heater/Boiler | Crude Charge Heater | Existing | 381 | 2,817,416 | 557,900 | Emission Factor | 7.45E-03 | 5.47E-02 | 25.76 | 12.84 | 12.84 | [D] |
| #3 Platformer | H-4401 | Y | Heater/Boiler | Charge Heater | Existing | 134 | 1,025,393 | 0 | Emission Factor | 7.45E-03 | | 3.82 | 1.91 | 1.91 | - |
| #3 Platformer | H-4402 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 128 | 721,833 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 2.69 | 1.34 | 1.34 | - |
| #3 Platformer | H-4451 | Y | Heater/Boiler | Charge Heater | Existing | 381 | 2,918,945 | 0 | Emission Factor | 7.45E-03 | | 10.87 | 5.44 | 5.44 | - |
| #3 Platformer | H-4452 | Y | Heater/Boiler | Intermediate Heater | Existing | 248 | 1,803,863 | 0 | Emission Factor | 7.45E-03 | | 6.72 | 3.36 | 3.36 | - |
| #3 Platformer | H-4453 | Y | Heater/Boiler | Intermediate Heater | Existing | 248 | 1,338,392 | 0 | Emission Factor | 7.45E-03 | | 4.99 | 2.49 | 2.49 | - |
| #3 Platformer | H-4454 | Y | Heater/Boiler | Intermediate Heater | Existing | 77 | 518,276 | 0 | Emission Factor | 7.45E-03 | | 1.93 | 0.97 | 0.97 | - |
| #3 Platformer | H-4455 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 138 | 1,076,287 | 0 | Emission Factor | 7.45E-03 | | 4.01 | 2.00 | 2.00 | - |
| #3 VAC | H-4201 | Y | Heater/Boiler | Prestripper Heater | Existing | 253 | 1,195,811 | 545,534 | Emission Factor | 7.45E-03 | 5.47E-02 | 19.38 | 9.71 | 9.71 | [D] |
| #3 VAC | H-4202 | Y | Heater/Boiler | Vacuum Heater | Existing | 245 | 962,882 | 553,169 | Emission Factor | 7.45E-03 | 5.47E-02 | 18.72 | 9.37 | 9.37 | [D] |
| #4 Platformer | H-5401 | Y | Heater/Boiler | Charge Heater | Existing | 134 | 983,723 | 0 | Emission Factor | 7.45E-03 | | 3.66 | 1.83 | 1.83 | - |

## Table C-11 Summary of Combustion Units PM2.5 BAE

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate/6-Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #4 Platformer | H-5402 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 128 | 684,930 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 2.55 | 1.28 | 1.28 | - |
| #4 Platformer | H-5451 | Y | Heater/Boiler | Charge Heater | Existing | 381 | 2,059,984 | 0 | Emission Factor | 7.45E-03 | | 7.67 | 3.84 | 3.84 | - |
| #4 Platformer | H-5452 | Y | Heater/Boiler | Intermediate Heater | Existing | 248 | 1,843,813 | 0 | Emission Factor | 7.45E-03 | | 6.87 | 3.43 | 3.43 | - |
| #4 Platformer | H-5453 | Y | Heater/Boiler | Intermediate Heater | Existing | 248 | 1,356,092 | 0 | Emission Factor | 7.45E-03 | | 5.05 | 2.53 | 2.53 | - |
| #4 Platformer | H-5454 | Y | Heater/Boiler | Intermediate Heater | Existing | 77 | 491,861 | 0 | Emission Factor | 7.45E-03 | | 1.83 | 0.92 | 0.92 | - |
| #4 Platformer | H-5455 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 138 | 1,014,968 | 0 | Emission Factor | 7.45E-03 | | 3.78 | 1.89 | 1.89 | - |
| #6 DD | H-4601A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 61 | 307,355 | 0 | Emission Factor | 7.45E-03 | | 1.15 | 0.57 | 0.57 | - |
| #6 DD | H-4601B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 61 | 306,150 | 0 | Emission Factor | 7.45E-03 | | 1.14 | 0.57 | 0.57 | - |
| #6 DD | H-4602 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 119 | 669,854 | 0 | Emission Factor | 7.45E-03 | | 2.50 | 1.25 | 1.25 | - |
| #6 DD | C-4601A | Y | Compressor | Reciprocating Gas Compressor | Existing | 21 | 86,488 | 0 | Emission Factor | 9.99E-03 | | 0.43 | 0.22 | 0.22 | - |
| #6 DD | C-4601B | Y | Compressor | Reciprocating Gas Compressor | Existing | 21 | 86,488 | 0 | Emission Factor | 9.99E-03 | | 0.43 | 0.22 | 0.22 | - |
| #6 DD | C-4601C | Y | Compressor | Reciprocating Gas Compressor | Existing | 21 | 86,488 | 0 | Emission Factor | 9.99E-03 | | 0.43 | 0.22 | 0.22 | - |
| #7 DD | H-4301A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 67 | 550,826 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 2.05 | 1.03 | 1.03 | - |
| #7 DD | H-4301B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 67 | 573,413 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 2.14 | 1.07 | 1.07 | - |
| #7 DD | H-4302 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 122 | 1,053,299 | 0 | Emission Factor | 7.45E-03 | | 3.92 | 1.96 | 1.96 | - |

## Table C-11 Summary of Combustion Units PM2.5 BAE

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate/6-Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #9 DD | H-5301A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 67 | 471,591 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 1.76 | 0.88 | 0.88 | - |
| #9 DD | H-5301B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 67 | 449,346 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 1.67 | 0.84 | 0.84 | - |
| #9 DD | H-5302 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 122 | 1,257,163 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 4.68 | 2.34 | 2.34 | - |
| LSG Unit | H-4901 | Y | Heater/Boiler | Charge Heater | Existing | 87 | 327,668 | 0 | Emission Factor | | | | 0.00 | 0.00 | [A] |
| Sulfuric Acid Plant | STK-7801 | Y | Heater/Boiler | Heater Stack | Existing | 30 | 119,284 | 0 | Emission Factor | 1.10E-02 | | 0.66 | 0.33 | 0.33 | - |
| Sulfuric Acid Plant | H-7801 | Y | Heater/Boiler | Process Air Heater | Existing | | | | Emission Factor | | | | 0.00 | | - |
| Sulfuric Acid Plant | H-7802 | Y | Heater/Boiler | Converter Heater | Existing | | | | Emission Factor | | | | 0.00 | | - |
| Sulfuric Acid Plant | R-7801 | Y | Heater/Boiler | Startup Heater | Existing | | | | Emission Factor | | | | 0.00 | | - |
| #1 SRU Incinerator | H-1032 | Y | Heater/Boiler | Tail Gas Incinerator | Existing | 7 | 9,702 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 0.04 | 0.02 | 0.02 | - |
| #2 SRU Incinerator | H-1042 | Y | Heater/Boiler | Tail Gas Incinerator | Existing | 15 | 73,434 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 0.27 | 0.14 | 0.14 | - |
| #1 Beavon | H-1061 | Y | TGTU | Sulfur Recovery Units, Tail gas treatment | Existing | 10 | 0 | 0 | Emission Factor | | | | 0.00 | 0.00 | [B] |
| #2 Beavon | H-4761 | Y | TGTU | Tail Gas Treatment | Existing | 10 | 0 | 0 | Emission Factor | | | | 0.00 | 0.00 | [B] |
| East Incinerator | H-4745 | Y | Heater/Boiler | Tail Gas Incinerator | Existing | 55 | 142,237 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 0.53 | 0.26 | 0.26 | - |
| Delayed Coker Unit | H-8501A | Y | Heater/Boiler | Coker process heater 1 | Existing | 200 | 2,480,262 | 0 | Emission Factor | 4.70E-03 | | 5.83 | 2.91 | 2.91 | - |
| Delayed Coker | H-8501B | Y | Heater/Boiler | Coker process heater | Existing | 200 | 2,472,154 | 0 | Emission Factor | 2.25E-03 | | 2.78 | 1.39 | 1.39 | - |
| Utility II | #5 Boiler (B-1155) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 539 | 1,765,918 | 811,841 | Emission Factor | 7.45E-03 | 5.47E-02 | 28.78 | 14.39 | 14.39 | [D] |
| Utility III | #6 Boiler (B-3301) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 257 | 1,271,145 | 480,095 | Emission Factor | 7.45E-03 | 5.47E-02 | 17.87 | 8.94 | 8.94 | [D], [E] |

**Table C-11 Summary of Combustion Units PM2.5 BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate/6-Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Utility III | #7 Boiler (B-3302) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 257 | 1,133,369 | 511,268 | Emission Factor | 7.45E-03 | 5.47E-02 | 18.21 | 9.11 | 9.10 | [D], [E] |
| Utility III | #8 Boiler (B-3303) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 512 | 2,503,750 | 1,163,089 | Emission Factor | 7.45E-03 | 5.47E-02 | 41.14 | 20.66 | 20.66 | [D] |
| Utility III | #9 Boiler (B-3304) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 512 | 1,976,231 | 977,844 | Emission Factor | 7.45E-03 | 5.47E-02 | 34.11 | 17.12 | 17.12 | [D] |
| Utility III | #10 Boiler (B-3701) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 225 | 1,532,157 | 0 | Emission Factor | 7.45E-03 | 5.47E-02 | 5.71 | 2.85 | 2.85 | - |
| Powerhouse 2 | GT No. 4 (G-3404) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 317 | 3,609,299 | 428,205 | Emission Factor | 6.60E-03 | 1.20E-02 | 14.48 | 7.24 | 7.24 | - |
| Powerhouse 2 | GT No. 5 (G-3405) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 317 | 3,657,276 | 201,966 | Emission Factor | 6.60E-03 | 1.20E-02 | 13.28 | 6.64 | 6.64 | - |
| Powerhouse 2 | GT No. 7 (G-3407) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 317 | 3,981,360 | 474,168 | Emission Factor | 6.60E-03 | 1.20E-02 | 15.98 | 7.99 | 7.99 | - |
| Powerhouse 2 | GT No. 8 (G-3408) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 392 | 1,787,553 | 506,126 | Emission Factor | 6.60E-03 | 1.20E-02 | 8.94 | 4.47 | 4.47 | - |
| Powerhouse 2 | GT No. 9 (G-3409) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 304 | 4,439,104 | 280,162 | Emission Factor | 6.60E-03 | 1.20E-02 | 16.33 | 8.17 | 8.17 | - |
| Powerhouse 2 | GT No. 10 (G-3410) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 325 (5) | 3,551,385 | 207,405 | Emission Factor | 6.60E-03 | 1.20E-02 | 12.96 | 6.48 | 6.48 | - |
| GT No. 13 and Duct Burner | GT No. 13 (G-3413) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 626 | 5,968,643 | 546,683 | Emission Factor | See Note [C] | | 22.45 | 11.22 | 11.22 | [C] |
| | | | | | | | | | | | | Total tpy | 285.01 | 285.01 | |

Notes: "-" indicates no adjustments to the BAE were required.

[A] Conservatively assumed zero contribution to the BAE used to set the proposed PAL.

[B] Beavons are not a source of particulate emissions

[C] Values obtained from hourly emissions data. Emission factors for firing scenarios provided below.

| Emission Factors | | Gas w/DB | as w/o I | Oil w/DB |
|---|---|---|---|---|
| | PM | 0.01 | 0.0046 | 0.0129 |

## Table C-11  Summary of Combustion Units PM2.5 BAE

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate/6-Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | PM10 | 0.0164 | 0.0082 | 0.016 | | | | | | | | | |

[D] Distillate/6-Oil emission factor is presented as average for the 2009-2010 period.  The emission factor is based on the sulfur content of the oil which varies slightly between 2009 and 2010.

[E] Emissions were downwardly adjusted for fuel oil usage of 35 barrels (bbls) above the combined 800 bbls/day limit for Boilers 6 & 7.  Adjustment assumes equal firing rate for Boilers 6 & 7.

**Table C-12 Summary of Non-Combustion Units PM2.5 BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Emission Calculation Parameter | Baseline Period 24 Month Parameter Total | Units | Emission Factor/Method | Emission Factor Units | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #2 Platformer | #2 Plat Vent | Y | Process | Plat No. 2 Catalyst Regen Vent | Existing | Operation | 4,135 | hrs | 0.0190 | lb/hr | 0.039 | 0.02 | 0.02 | - |
| #3 Platformer | #3 Plat Vent | Y | Process | Plat No. 3 Catalyst Regen Vent | Existing | Operation | 12,829 | hrs | 0.0343 | lb/hr | 0.220 | 0.11 | 0.11 | - |
| #4 Platformer | #4 Plat Vent | Y | Process | Plat No. 4 Catalyst Regen Vent | Existing | Operation | 11,661 | hrs | 0.0343 | lb/hr | 0.200 | 0.10 | 0.10 | - |
| FCCU | STK-7051 | Y | WGS | Fluid Catalytic Cracking | Existing | Coke Burn | 1,125,834 | Mlbs | 0.3062 | lb/Mlb Coke Burn | 172.37 | 86.18 | 86.18 | - |
| FCCU Catalyst | FCCU Catalyst | Y | Fugitive PM | Fluid Catalytic Cracking | Existing | Cat Load | 23,271,014 | lbs | 0.0454 | lb/ton material load | 0.07 | 0.03 | 0.03 | [A] |
| Sulfuric Acid Plant | STK-7802 | Y | Process | Process Stack | Existing | | | | | | | 0.00 | 0.00 | [B] |
| # 1 Beavon | Beavon CT #1 | Y | Fugitive PM | Beavon CT #1 | Existing | Throughput | 9,084,960,000 | Gals | TDS/Drift | | | 0.00 | 0.00 | [C] |
| # 2 Beavon | Beavon CT #2 | Y | Fugitive PM | Beavon CT #2 | Existing | Throughput | 9,081,180,000 | Gals | TDS/Drift | | | 0.00 | 0.00 | [C] |
| West Sulfur Storage Area | Materials Handling | Y | Fugitive PM | Materials Handling | Existing | Material transferred | 91,127 | tons | 0.0010 | lb/ton material trans | 0.73 | 0.36 | 0.36 | [D] |
| East Sulfur Storage Area | Materials Handling | Y | Fugitive PM | Materials Handling | Existing | Material transferred | 148,728 | tons | 0.0010 | lb/ton material trans | 1.55 | 0.78 | 0.78 | [D] |
| Refinery Flare System | #2 Flare (H-1105) | Y | Flare | Gas burner | Existing | Heat Release | 3,163,635 | MMBtu | 7.45E-03 | lb/MMBtu | 11.79 | 5.89 | 5.89 | - |
| Refinery Flare System | #3 Flare (H-1104) | Y | Flare | Gas burner | Existing | Heat Release | 1,574,064 | MMBtu | 7.45E-03 | lb/MMBtu | 5.86 | 2.93 | 2.93 | - |
| Refinery Flare System | #5 Flare (H-3351) | Y | Flare | Gas burner | Existing | Heat Release | 2,291,870 | MMBtu | 7.45E-03 | lb/MMBtu | 8.54 | 4.27 | 4.27 | - |
| Refinery Flare System | #6 Flare (H-3352) | Y | Flare | Gas burner | Existing | Heat Release | 1,134,206 | MMBtu | 7.45E-03 | lb/MMBtu | 4.23 | 2.11 | 2.11 | - |
| Refinery Flare System | #7 Flare (H-3301) | Y | Flare | Gas burner | Existing | Heat Release | 3,730,347 | MMBtu | 7.45E-03 | lb/MMBtu | 13.90 | 6.95 | 6.95 | - |
| Refinery Flare System | LPG Flare (STK 7921) | Y | Flare | Gas burner, steam assisted | Existing | Heat Release | 0 | MMBtu | 7.45E-03 | lb/MMBtu | 0.00 | 0.00 | 0.00 | - |
| Refinery Flare System | FCC Flare (L.P. Flare - STK 7941) | Y | Flare | Gas burner, steam assisted | Existing | Heat Release | 2,541,561 | MMBtu | 7.45E-03 | lb/MMBtu | 9.47 | 4.73 | 4.73 | - |
| Refinery Flare System | Ground Flare (H.P. Flare - STK 7942) | Y | Flare | Gas burner | Existing | Heat Release | 451,355 | MMBtu | 7.45E-03 | lb/MMBtu | 1.68 | 0.84 | 0.84 | - |
| Delayed Coker Unit | TK-8501 | Y | Tank Fug | Fixed roof storage tank (pitch) | Existing | | | | AP-42 | | | 0.04 | 0.04 | [I] |
| Coker Complex | Coke handling, storage, and loading system | Y | Fugitive PM | Transportation and breaking of solid coke between drums and dock | Existing | Throughput | 2,144,901 | tons coke | | | 11.13 | 5.56 | 5.56 | [H] |
| Coker Complex | Delayed Coker Steam Vent | Y | Process | Delayed Coker Steam Vent | Existing | ker Drum Vent Episo | 1,442 | Episodes | 61.6 | lb/episode | 44.41 | 22.21 | 11.86 | [G] |
| Storage pile and conveyor | Storage pile and conveyor | Y | Fugitive PM | Sulfur storage and | Existing | Material transferred | 212,773 | tons | 9.78E-04 | lb/ton material trans | 2.11 | 1.05 | 1.05 | [D] |
| Roads | Roads | Y | Fugitive PM | Road Traffic | Existing | VMT | 1,825,000 | Miles | 0.0023 | lb/VMT | 2.07 | 1.04 | 1.04 | [E] |
| Fire Training | Fire Training | Y | Flare | Fire Training | Existing | Fuel Usage | 48,778 | lbs | 0.13 | lb/lb fuel | 3.122 | 1.56 | 1.56 | [F] |
| | | | | | | | | | | | Total (tpy) | 147 | 136 | |

Notes: "-" indicates no adjustments to the BAE were required.

[A] FCCU catalyst loading emissions calculated using AP-42 Section 13.2.4.3. Emissions are from hopper loading, reactor loading, and reactor dumping. 50% control efficiency assumed for reactor loading and dumping. .

**Table C-12 Summary of Non-Combustion Units PM2.5 BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Emission Calculation Parameter | Baseline Period 24 Month Parameter Total | Units | Emission Factor/Method | Emission Factor Units | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| + | 3.54E+06 | lbs reactor load | | ton | 0.045421255 | lb PM | 0.5 |
| | | baseline | 2000 | lbs | | ton load | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| + | 2.94E+06 | lbs reactor dump | | ton | 0.045421255 | lb PM | 0.5 |
| | | baseline | 2000 | lbs | | ton load | |

= 1.54E+02 lbs PM

= 7.70E-02 tons PM

[B] Sulfuric Acid Plant process stack is not a source of PM emissions

[C] PM2.5 fraction determined to be zero using Reisman & Frisbie wet droplet size distribution methodology in "Calculating Realistic PM10 Emissions from Cooling Towers".

[D] PM emissions calculated using AP-42 Section 13.2.4.3. Emissions from East and West sulfur storage are from drop from conveyor, truck loading, and wind erosion. Emissions from are from truck unloading, conveyor loading ship loading, and wind

Example Calc:

| | | | | |
|---|---|---|---|---|
| West Side Baseline Total PM Emissions= | 9.11E+04 | tons conveyor dr | 0.0137 | lb PM |
| | | baseline | | ton load |

| | | | | |
|---|---|---|---|---|
| + | 9.11E+04 | truck loading | 0.0137 | lb PM |
| | | baseline | | ton load |

| | | | | |
|---|---|---|---|---|
| + | 1.00 | acre | 3.5 | lb PM |
| | | West Side | | acre/day |

= 3.77E+03 lbs PM

= 1.88 tons PM

[E] VMT = vehicle miles travelled. Calculation reference: AP-42 Chapter 13.2

[F] Emission factors for fire traing (JP-4) per "Calculation Methods for Criteria Air Pollutant Emission Inventories", Brooks Air Force Base, TX, July 1994

[G] PM BAE from the delayed coker vent were downwardly adjusted to comply with 2 psig depressurization standard in Consent Decree.

[H] Estimates based on AP-42, Chapter 13.2.4, Equation 1. See Appendix B of this application for calculation methodology.

[I] Estimates based on AP-42, Chapter 11.1. See Appendix B of this application for calculation methodology.

## Table C-13 Summary of Combustion Units SO2 BAE

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #2 DU Fractionator | H-101 | Y | Heater/Boiler | Heater | Existing | 146 | 791,295 | 43,469 | Emission Factor | 5.58E-03 | 3.90E-01 | 10.68 | 5.33 | 5.19 | [A] |
| #2 DU Fractionator | H-104 | Y | Heater/Boiler | Heater | Existing | 108 | 654,318 | 40,043 | Emission Factor | 5.58E-03 | 3.90E-01 | 9.63 | 4.76 | 4.64 | [A] |
| #2 CDU | H-401A | Y | Heater/Boiler | Charge Heater | Existing | 171 | 828,797 | 257,804 | Emission Factor | 5.58E-03 | 3.90E-01 | 52.55 | 26.73 | 26.68 | [A] |
| #2 CDU | H-401B | Y | Heater/Boiler | Charge Heater | Existing | 171 | 828,797 | 257,804 | Emission Factor | 5.58E-03 | 3.90E-01 | 52.55 | 26.73 | 26.68 | [A] |
| #2 CDU | H-401C | Y | Heater/Boiler | Charge Heater | Existing | 171 | 828,797 | 257,804 | Emission Factor | 5.58E-03 | 3.90E-01 | 52.55 | 26.73 | 26.68 | [A] |
| #3 DD | C-1500A | Y | Compressor | Reciprocating Gas Compressor | Existing | 3 | 15,104 | 0 | Emission Factor | 5.88E-04 | | 4.44E-03 | 2.22E-03 | 2.22E-03 | - |
| #3 DD | C-1500B | Y | Compressor | Reciprocating Gas Compressor | Existing | 3 | 15,104 | 0 | Emission Factor | 5.88E-04 | | 4.44E-03 | 2.22E-03 | 2.22E-03 | - |
| #3 DD | C-1500C | Y | Compressor | Reciprocating Gas Compressor | Existing | 3 | 15,104 | 0 | Emission Factor | 5.88E-04 | | 4.44E-03 | 2.22E-03 | 2.22E-03 | - |
| Penex | H-200 | Y | Heater/Boiler | Charge Heater | Existing | 37 | 389,579 | 0 | Emission Factor | 5.58E-03 | | 1.09 | 0.61 | 0.56 | [A] |
| Penex | H-201 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 37 | 395,352 | 0 | Emission Factor | 5.58E-03 | | 1.10 | 0.62 | 0.56 | [A] |
| Penex | H-202 | Y | Heater/Boiler | Hot Oil Heater | Existing | 122 | 874,691 | 0 | Emission Factor | 5.58E-03 | 3.90E-01 | 2.44 | 1.48 | 1.41 | [A] |
| Penex | C-200A | Y | Compressor | Reciprocating Gas Compressor | Existing | 9 | 75,121 | 0 | Emission Factor | 5.88E-04 | | 0.02 | 0.01 | 0.01 | - |
| Penex | C-200B | Y | Compressor | Reciprocating Gas Compressor | Existing | 9 | 75,121 | 0 | Emission Factor | 5.88E-04 | | 0.02 | 0.01 | 0.01 | - |
| Penex | C-200C | Y | Compressor | Reciprocating Gas Compressor | Existing | 9 | 75,121 | 0 | Emission Factor | 5.88E-04 | | 0.02 | 0.01 | 0.01 | - |
| Utility Fractionation | H-160 | Y | Heater/Boiler | Charge Heater | Existing | 135 | 884,143 | 0 | Emission Factor | 5.58E-03 | 3.90E-01 | 2.46 | 1.44 | 1.34 | [A] |
| #2 Platformer | H-601 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 36 | 221,021 | 0 | Emission Factor | 5.58E-03 | 3.90E-01 | 0.62 | 0.32 | 0.28 | [A] |
| #2 Platformer | H-604 | Y | Heater/Boiler | Platforming No. 2 Interheater | Existing | 37 | 214,990 | 0 | Emission Factor | 5.58E-03 | 3.90E-01 | 0.60 | 0.32 | 0.28 | [A] |

## Table C-13 Summary of Combustion Units SO2 BAE

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #2 Platformer | H-605 | Y | Heater/Boiler | Platforming No. 3 Interheater | Existing | 15 | 59,776 | 0 | Emission Factor | 5.58E-03 | 3.90E-01 | 0.17 | 0.09 | 0.08 | [A] |
| #2 DU | H-800A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 43 | 461,566 | 0 | Emission Factor | 5.58E-03 | 3.90E-01 | 1.29 | 0.72 | 0.66 | [A] |
| #2 DU | H-800B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 43 | 441,880 | 0 | Emission Factor | 5.58E-03 | 3.90E-01 | 1.23 | 0.70 | 0.64 | [A] |
| #2 DU | H-801 | Y | Heater/Boiler | Stripper Heater | Existing | 101 | 803,114 | 0 | Emission Factor | 5.58E-03 | | 2.24 | 1.34 | 1.26 | [A] |
| #4 DD | H-2201A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 61 | 690,666 | 0 | Emission Factor | 5.58E-03 | 3.90E-01 | 1.93 | 1.03 | 0.90 | [A] |
| #4 DD | H-2201B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 61 | 690,666 | 0 | Emission Factor | 5.58E-03 | 3.90E-01 | 1.93 | 1.03 | 0.90 | [A] |
| #4 DD | H-2202 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 119 | 980,002 | 0 | Emission Factor | 5.58E-03 | | 2.73 | 1.53 | 1.38 | [A] |
| #5 DD | H-2400 | Y | Heater/Boiler | Charge Heater | Existing | 33 | 463,511 | 0 | Emission Factor | 5.58E-03 | 3.90E-01 | 1.29 | 0.68 | 0.60 | [A] |
| #5 DD | C-2400A | Y | Compressor | Reciprocating Gas Compressor | Existing | 7 | 48,723 | 0 | Emission Factor | 5.88E-04 | | 0.01 | 0.01 | 0.01 | - |
| #5 DD | C-2400B | Y | Compressor | Reciprocating Gas Compressor | Existing | 7 | 48,723 | 0 | Emission Factor | 5.88E-04 | | 0.01 | 0.01 | 0.01 | - |
| Naphtha Fractionation | H-2501 | Y | Heater/Boiler | Reboiler Heater | Existing | 203 | 437,565 | 0 | Emission Factor | 5.58E-03 | | 1.22 | 0.67 | 0.61 | [A] |
| #2 Sulfolane | H-4502 | Y | Heater/Boiler | Benzene Column Reboiler Heater | Existing | 149 | 858,943 | 0 | Emission Factor | 1.90E-02 | 3.90E-01 | 8.17 | 4.14 | 4.09 | [A] |
| #2 Sulfolane | H-4503 | Y | Heater/Boiler | Toluene Column Reboiler Heater | Existing | 141 | 753,962 | 0 | Emission Factor | 1.90E-02 | | 7.17 | 3.63 | 3.58 | [A] |
| #2 Sulfolane | H-4504 | Y | Heater/Boiler | Xylene Column Reboiler Heater | Existing | 126 | 607,009 | 0 | Emission Factor | 1.90E-02 | 3.90E-01 | 5.77 | 2.92 | 2.88 | [A] |
| #2 Sulfolane | H-4505 | Y | Heater/Boiler | Raffinate Splitter Reboiler Heater | Existing | 109 | 470,895 | 0 | Emission Factor | 1.90E-02 | 3.90E-01 | 4.48 | 2.26 | 2.22 | [A] |
| #5 CDU | H-3101A | Y | Heater/Boiler | Crude Charge Heater | Existing | 381 | 2,184,815 | 614,217 | Emission Factor | 1.90E-02 | 3.90E-01 | 140.47 | 70.30 | 70.15 | [A] |

## Table C-13  Summary of Combustion Units SO2 BAE

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #5 CDU | H-3101B | Y | Heater/Boiler | Crude Charge Heater | Existing | 381 | 2,436,185 | 659,430 | Emission Factor | 1.90E-02 | 3.90E-01 | 151.67 | 75.73 | 75.58 | [A] |
| #6 CDU | H-4101A | Y | Heater/Boiler | Crude Charge Heater | Existing | 381 | 2,446,267 | 516,409 | Emission Factor | 1.90E-02 | 3.90E-01 | 123.90 | 61.64 | 61.47 | [A] |
| #6 CDU | H-4101B | Y | Heater/Boiler | Crude Charge Heater | Existing | 381 | 2,817,416 | 557,900 | Emission Factor | 1.90E-02 | 3.90E-01 | 135.51 | 67.31 | 67.13 | [A] |
| #3 Platformer | H-4401 | Y | Heater/Boiler | Charge Heater | Existing | 134 | 1,025,393 | 0 | Emission Factor | 1.90E-02 | | 9.75 | 4.95 | 4.89 | [A] |
| #3 Platformer | H-4402 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 128 | 721,833 | 0 | Emission Factor | 1.90E-02 | 3.90E-01 | 6.87 | 3.47 | 3.42 | [A] |
| #3 Platformer | H-4451 | Y | Heater/Boiler | Charge Heater | Existing | 381 | 2,918,945 | 0 | Emission Factor | 1.90E-02 | | 27.77 | 14.10 | 13.93 | [A] |
| #3 Platformer | H-4452 | Y | Heater/Boiler | Intermediate Heater | Existing | 248 | 1,803,863 | 0 | Emission Factor | 1.90E-02 | | 17.16 | 8.71 | 8.60 | [A] |
| #3 Platformer | H-4453 | Y | Heater/Boiler | Intermediate Heater | Existing | 248 | 1,338,392 | 0 | Emission Factor | 1.90E-02 | | 12.73 | 6.42 | 6.33 | [A] |
| #3 Platformer | H-4454 | Y | Heater/Boiler | Intermediate Heater | Existing | 77 | 518,276 | 0 | Emission Factor | 1.90E-02 | | 4.93 | 2.50 | 2.47 | [A] |
| #3 Platformer | H-4455 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 138 | 1,076,287 | 0 | Emission Factor | 1.90E-02 | | 10.24 | 5.20 | 5.14 | [A] |
| #3 VAC | H-4201 | Y | Heater/Boiler | Prestripper Heater | Existing | 253 | 1,195,811 | 545,534 | Emission Factor | 1.90E-02 | 3.90E-01 | 117.68 | 59.21 | 59.13 | [A] |
| #3 VAC | H-4202 | Y | Heater/Boiler | Vacuum Heater | Existing | 245 | 962,882 | 553,169 | Emission Factor | 1.90E-02 | 3.90E-01 | 116.95 | 58.70 | 58.62 | [A] |
| #4 Platformer | H-5401 | Y | Heater/Boiler | Charge Heater | Existing | 134 | 983,723 | 0 | Emission Factor | 1.90E-02 | | 9.36 | 4.74 | 4.68 | [A] |
| #4 Platformer | H-5402 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 128 | 684,930 | 0 | Emission Factor | 1.90E-02 | 3.90E-01 | 6.52 | 3.28 | 3.23 | [A] |
| #4 Platformer | H-5451 | Y | Heater/Boiler | Charge Heater | Existing | 381 | 2,059,984 | 0 | Emission Factor | 1.90E-02 | | 19.60 | 9.87 | 9.70 | [A] |
| #4 Platformer | H-5452 | Y | Heater/Boiler | Intermediate Heater | Existing | 248 | 1,843,813 | 0 | Emission Factor | 1.90E-02 | | 17.54 | 8.89 | 8.77 | [A] |
| #4 Platformer | H-5453 | Y | Heater/Boiler | Intermediate Heater | Existing | 248 | 1,356,092 | 0 | Emission Factor | 1.90E-02 | | 12.90 | 6.50 | 6.39 | [A] |
| #4 Platformer | H-5454 | Y | Heater/Boiler | Intermediate Heater | Existing | 77 | 491,861 | 0 | Emission Factor | 1.90E-02 | | 4.68 | 2.36 | 2.33 | [A] |
| #4 Platformer | H-5455 | Y | Heater/Boiler | Fired Reboiler Heater | Existing | 138 | 1,014,968 | 0 | Emission Factor | 1.90E-02 | | 9.66 | 4.89 | 4.83 | [A] |
| #6 DD | H-4601A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 61 | 307,355 | 0 | Emission Factor | 1.90E-02 | | 2.92 | 1.48 | 1.46 | [A] |
| #6 DD | H-4601B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 61 | 306,150 | 0 | Emission Factor | 1.90E-02 | | 2.91 | 1.48 | 1.46 | [A] |
| #6 DD | H-4602 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 119 | 669,854 | 0 | Emission Factor | 1.90E-02 | | 6.37 | 3.23 | 3.19 | [A] |

## Table C-13 Summary of Combustion Units SO2 BAE

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #6 DD | C-4601A | Y | Compressor | Reciprocating Gas Compressor | Existing | 21 | 86,488 | 0 | Emission Factor | 5.88E-04 | | 0.03 | 0.01 | 0.01 | - |
| #6 DD | C-4601B | Y | Compressor | Reciprocating Gas Compressor | Existing | 21 | 86,488 | 0 | Emission Factor | 5.88E-04 | | 0.03 | 0.01 | 0.01 | - |
| #6 DD | C-4601C | Y | Compressor | Reciprocating Gas Compressor | Existing | 21 | 86,488 | 0 | Emission Factor | 5.88E-04 | | 0.03 | 0.01 | 0.01 | - |
| #7 DD | H-4301A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 67 | 550,826 | 0 | Emission Factor | 1.90E-02 | 3.90E-01 | 5.24 | 2.63 | 2.58 | [A] |
| #7 DD | H-4301B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 67 | 573,413 | 0 | Emission Factor | 1.90E-02 | 3.90E-01 | 5.45 | 2.74 | 2.69 | [A] |
| #7 DD | H-4302 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 122 | 1,053,299 | 0 | Emission Factor | 1.90E-02 | | 10.02 | 5.03 | 4.94 | [A] |
| #9 DD | H-5301A | Y | Heater/Boiler | Reactor Charge Heater | Existing | 67 | 471,591 | 0 | Emission Factor | 1.90E-02 | 3.90E-01 | 4.49 | 2.27 | 2.24 | [A] |
| #9 DD | H-5301B | Y | Heater/Boiler | Reactor Charge Heater | Existing | 67 | 449,346 | 0 | Emission Factor | 1.90E-02 | 3.90E-01 | 4.27 | 2.16 | 2.13 | [A] |
| #9 DD | H-5302 | Y | Heater/Boiler | Stripper Reboiler Heater | Existing | 122 | 1,257,163 | 0 | Emission Factor | 1.90E-02 | 3.90E-01 | 11.96 | 6.08 | 6.02 | [A] |
| LSG Unit | H-4901 | Y | Heater/Boiler | Charge Heater | Existing | 87 | 327,668 | | Emission Factor | | | | 0.00 | 0.00 | [D] |
| Sulfuric Acid Plant | STK-7801 | Y | Heater/Boiler | Heater Stack | Existing | 30 | 73,671 | 0 | Emission Factor | | | | 0.06 | 0.06 | [B] |
| Sulfuric Acid Plant | H-7801 | Y | Heater/Boiler | Process Air Heater | Existing | | | | Emission Factor | | | | | | |
| Sulfuric Acid Plant | H-7802 | Y | Heater/Boiler | Converter Heater | Existing | | | | Emission Factor | | | | | | |
| Sulfuric Acid Plant | R-7801 | Y | Heater/Boiler | Startup Heater | Existing | | | | Emission Factor | | | | | | |
| #1 SRU Incinerator | H-1032 | Y | Heater/Boiler | Tail Gas Incinerator | Existing | 7 | 9,702 | 0 | Emission Factor | 5.58E-03 | 3.90E-01 | 0.03 | 0.29 | 0.29 | [A] |
| #2 SRU Incinerator | H-1042 | Y | Heater/Boiler | Tail Gas Incinerator | Existing | 15 | 73,434 | 0 | Emission Factor | 5.58E-03 | 3.90E-01 | 0.20 | 0.12 | 0.11 | [A] |
| #1 Beavon | H-1061 | Y | TGTU | Sulfur Recovery Units, Tail gas treatment | Existing | 10 | 0 | 0 | Emission Factor | | | | | | - |
| #2 Beavon | H-4761 | Y | TGTU | Tail Gas Treatment | Existing | 10 | 0 | 0 | Emission Factor | | | | | | - |

**Table C-13 Summary of Combustion Units SO2 BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East Incinerator | H-4745 | Y | Heater/Boiler | Tail Gas Incinerator | Existing | 55 | 142,237 | 0 | Emission Factor | 1.90E-02 | 3.90E-01 | 1.35 | 250.39 | 250.38 | [A] |
| Delayed Coker Unit | H-8501A | Y | Heater/Boiler | Coker process heater 1 | Existing | 200 | 2,480,262 | 0 | CEMS | CEMS | | | 5.36 | 5.25 | [C] |
| Delayed Coker | H-8501B | Y | Heater/Boiler | Coker process heater | Existing | 200 | 2,472,154 | 0 | CEMS | CEMS | | | 5.39 | 5.30 | [C] |
| Utility II | #5 Boiler (B-1155) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 539 | 1,765,918 | 811,841 | Emission Factor | 5.58E-03 | 3.90E-01 | 163.12 | 81.79 | 81.55 | [A] |
| Utility III | #6 Boiler (B-3301) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 257 | 1,271,145 | 480,095 | Emission Factor | 1.90E-02 | 3.90E-01 | 105.64 | 53.01 | 52.92 | [A], [F] |
| Utility III | #7 Boiler (B-3302) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 257 | 1,133,369 | 511,268 | Emission Factor | 1.90E-02 | 3.90E-01 | 110.41 | 55.30 | 55.21 | [A], [F] |
| Utility III | #8 Boiler (B-3303) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 512 | 2,503,750 | 1,163,089 | Emission Factor | 1.90E-02 | 3.90E-01 | 250.46 | 126.88 | 126.70 | [A] |
| Utility III | #9 Boiler (B-3304) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 512 | 1,976,231 | 977,844 | Emission Factor | 1.90E-02 | 3.90E-01 | 209.34 | 105.90 | 105.74 | [A] |
| Utility III | #10 Boiler (B-3701) | Y | Heater/Boiler | Boiler; Produces Steam | Existing | 225 | 1,532,157 | 0 | Emission Factor | 1.90E-02 | 3.90E-01 | 14.58 | 7.37 | 7.27 | [A] |
| Powerhouse 2 | GT No. 4 (G-3404) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 317 | 3,609,299 | 428,205 | Emission Factor | 1.15E-02 | 2.35E-02 | 25.80 | 12.82 | 12.67 | [A] |
| Powerhouse 2 | GT No. 5 (G-3405) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 317 | 3,657,276 | 201,966 | Emission Factor | 1.15E-02 | 2.35E-02 | 23.42 | 12.00 | 11.85 | [A] |
| Powerhouse 2 | GT No. 7 (G-3407) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 317 | 3,981,360 | 474,168 | Emission Factor | 1.15E-02 | 2.35E-02 | 28.48 | 14.20 | 14.04 | [A] |
| Powerhouse 2 | GT No. 8 (G-3408) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 392 | 1,787,553 | 506,126 | Emission Factor | 1.15E-02 | 2.35E-02 | 16.23 | 8.77 | 8.69 | [A] |
| Powerhouse 2 | GT No. 9 (G-3409) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 304 | 4,439,104 | 280,162 | Emission Factor | 1.15E-02 | 2.35E-02 | 28.84 | 14.48 | 14.29 | [A] |
| Powerhouse 2 | GT No. 10 (G-3410) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 325 (5) | 3,551,385 | 207,405 | Emission Factor | 1.15E-02 | 2.35E-02 | 22.88 | 11.52 | 11.38 | [A] |

Table C-13  Summary of Combustion Units SO2 BAE

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Unit Size (MMBtu/hr) | Baseline Fuel Gas or Other Gaseous Fuel 24 mo Throughput (MMBtu/yr) | Baseline Distillate Oil 24 mo Throughput (MMBtu/yr) | BAE Estimation Method | Fuel Gas or Other Gaseous Fuel Emission Factor (lb/MMBtu) | Distillate/6-Oil Emission Factor (lb/MMBtu) | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GT No. 13 and Duct Burner | GT No. 13 (G-3413) | Y | Gas Turbine | Turbine; Produces Electricity | Existing | 626 | 5,968,643 | 546,683 | CEMS | | | 7.34 | 3.67 | 3.67 | [E] |
| | | | | | | | | | | | | Total tpy | 1391.10 | 1385.02 | |

Notes: "-" indicates no adjustments to the BAE were required.

[A] The fuel combustion devices serviced by the East and West side fuel gas systems are subject to the subparts J and Ja, respectively. To satisfy the requirement to downwardly adjust the BAE to exclude any emissions not in compliance with these subparts, samples measuring greater than 162ppm H2S were removed from the data used to generate the average H2S fuel content during the baseline period. Distillate/6-Oil emission factor is presented as average for the 2009-2010 period. The emission factor is based on the sulfur content of the oil which varies slightly between 2009 and 2010.

[B] The sulfuric acid plant heater stack hourly mass emissions were downwardly adjusted to address exceedances of the 162 ppm fuel H2S content. The highest "n" mass emission rates were identified for each quarter, where "n" is equal to the hours of exceedance in that quarter, and set equal to zero.

[C] The delayed coker heaters hourly mass emissions were downwardly adjusted to address exceedances of the 162 ppm fuel H2S content. The highest "n" mass emission rates were identified for each quarter, where "n" is equal to the hours of exceedance in that quarter, and set equal to zero.

[D] Conservatively assumed zero contribution to the BAE used to set the proposed PAL.

[E] SO2 emissions determined using H2S CEMS.

[F] Emissions were downwardly adjusted for fuel oil usage of 35 barrels (bbls) above the combined 800 bbls/day limit for Boilers 6 & 7. Adjustment assumes equal firing rate for Boilers 6 & 7.

**Table C-14 Summary of NonCombustion Units SO2 BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Emission Calculation Parameter | Baseline Period 24 Month Parameter Total | Units | Emission Factor/Method | Emission Factor Units | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| #2 Platformer | #2 Plat Vent | Y | Process | Plat No. 2 Catalyst Regen Vent | Existing | Operation | 4,135 | hrs | 0.07 | lb/hr | 0.15 | 0.08 | 0.08 | - |
| #3 Platformer | #3 Plat Vent | Y | Process | Plat No. 3 Catalyst Regen Vent | Existing | Operation | 12,829 | hrs | 0.132 | lb/hr | 0.85 | 0.42 | 0.42 | - |
| #4 Platformer | #4 Plat Vent | Y | Process | Plat No. 4 Catalyst Regen Vent | Existing | Operation | 11,661 | hrs | 0.132 | lb/hr | 0.77 | 0.38 | 0.38 | - |
| FCCU | STK-7051 | Y | WGS | Fluid Catalytic Cracking | Existing | | | | CEMS | | | 27.99 | 27.99 | - |
| Sulfuric Acid Plant | STK-7802 | Y | Process | Process Stack | Existing | | | | CEMS | | | 73.04 | 72.78 | [B] |
| Refinery Flare System | #2 Flare (H-1105) | Y | Flare | Gas burner | Existing | Heat Release | 3,163,635 | MMBtu | 0.0265 | lb/MMBtu | 41.99 | 20.99 | 20.99 | - |
| Refinery Flare System | #3 Flare (H-1104) | Y | Flare | Gas burner | Existing | Heat Release | 1,574,064 | MMBtu | 0.0265 | lb/MMBtu | 20.89 | 10.45 | 10.45 | - |
| Refinery Flare System | #5 Flare (H-3351) | Y | Flare | Gas burner | Existing | Heat Release | 2,291,870 | MMBtu | 0.0265 | lb/MMBtu | 30.42 | 15.21 | 15.21 | - |
| Refinery Flare System | #6 Flare (H-3352) | Y | Flare | Gas burner | Existing | Heat Release | 1,134,206 | MMBtu | 0.0265 | lb/MMBtu | 15.05 | 7.53 | 7.53 | - |
| Refinery Flare System | #7 Flare (H-3301) | Y | Flare | Gas burner | Existing | Heat Release | 3,730,347 | MMBtu | 0.0265 | lb/MMBtu | 49.51 | 24.75 | 24.75 | - |
| Refinery Flare System | LPG Flare (STK 7921) | Y | Flare | Gas burner, steam assisted | Existing | Heat Release | 0 | MMBtu | 0.0265 | lb/MMBtu | 0.00 | 0.00 | 0.00 | - |
| Refinery Flare System | FCC Flare (L.P. Flare - STK 7941) | Y | Flare | Gas burner, steam assisted | Existing | Heat Release | 2,541,561 | MMBtu | 0.0265 | lb/MMBtu | 33.73 | 16.87 | 16.87 | - |
| Refinery Flare System | Ground Flare (H.P. Flare - STK 7942) | Y | Flare | Gas burner | Existing | Heat Release | 451,355 | MMBtu | 0.0265 | lb/MMBtu | 5.99 | 3.00 | 3.00 | - |

**Table C-14 Summary of NonCombustion Units SO2 BAE**

| Process Unit | Source ID | PAL Unit (Y/N) | Emission Type | Unit Description | Unit Status | Emission Calculation Parameter | Baseline Period 24 Month Parameter Total | Units | Emission Factor/Method | Emission Factor Units | Baseline Period 24 Month Total Emissions (tons) | BAE (tpy | Adjusted BAE (tpy) | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Coker Complex | Delayed Coker Steam Vent | Y | Process | Delayed Coker Steam Vent | Existing | ker Drum Vent Episo | 1,442 | Episodes | 2.8 | lb/episode | 2.02 | 1.01 | 1.01 | - |
| Fire Training | Fire Training | Y | Flare | Fire Training | Existing | Fuel Usage | 48,778 | lbs | 0 | lb/lb fuel | 0 | 0 | 0 | [C] |

Notes: "-" indicates no adjustments to the BAE were required.

[A] [Reserved]

[B] Sulfuric Acid Plant process stack emissions were downwardly adjusted by the exceedances reported to the Division of Environmental Protection, Department of Planning & Natural Resources in 2009 and 2010.

[C] Emission factors for fire traing (JP-4) per "Calculation Methods for Criteria Air Pollutant Emission Inventories", Brooks Air Force Base, TX, July 1994

| Table C-15. Combustion Unit Emission Factors | | | | | |
|---|---|---|---|---|---|
| **Unit Type** | **Fuel Fired** | **Pollutant** | **Value** | **Units** | **Comment** |
| Heater/Boiler | Fuel Gas | VOC | 5.39E-03 | lb/MMBtu | AP-42 Table 1.4-2; Footnote a: 1020 Btu/scf conversion |
| Heater/Boiler | Fuel Gas | CO | 8.24E-02 | lb/MMBtu | AP-42 Table 1.4-1; Footnote a: 1020 Btu/scf conversion |
| Heater/Boiler | Fuel Gas | $NO_X$ | 2.75E-01 | lb/MMBtu | AP-42 Table 1.4-1; Footnote a: 1020 Btu/scf conversion |
| Heater/Boiler | Fuel Gas | PM | 1.86E-03 | lb/MMBtu | AP-42 Table 1.4-2; Footnote a: 1020 Btu/scf conversion |
| Heater/Boiler | Fuel Gas | $PM_{10}$ | 7.45E-03 | lb/MMBtu | AP-42 Table 1.4-2; Footnote a: 1020 Btu/scf conversion |
| Heater/Boiler | Fuel Gas | $PM_{2.5}$ | 7.45E-03 | lb/MMBtu | AP-42 Table 1.4-2; Footnote a: 1020 Btu/scf conversion |
| Heater/Boiler | Fuel Gas | AVG $SO_2$ EFG | 1.90E-02 | lb/MMBtu | Based on average S concentration of 112 ppmv in 2009 and 118 in 2010; Footnote a: 1020 Btu/scf conversion |
| Heater/Boiler | Fuel Gas | AVG $SO_2$ WFG | 5.58E-03 | lb/MMBtu | Based on average S concentration of 43 ppmv in 2009 and 24.8 in 2010; Footnote a: 1020 Btu/scf conversion |
| | | | | | |
| Heater/Boiler | Fuel Gas<100 | VOC | 5.39E-03 | lb/MMBtu | AP-42 Table 1.4-2; Footnote a: 1020 Btu/scf conversion |
| Heater/Boiler | Fuel Gas<100 | CO | 8.24E-02 | lb/MMBtu | AP-42 Table 1.4-1; Footnote a: 1020 Btu/scf conversion |
| Heater/Boiler | Fuel Gas<100 | $NO_X$ | 9.80E-02 | lb/MMBtu | AP-42 Table 1.4-1; Footnote a: 1020 Btu/scf conversion |
| Heater/Boiler | Fuel Gas<100 | PM | 1.86E-03 | lb/MMBtu | AP-42 Table 1.4-2; Footnote a: 1020 Btu/scf conversion |
| Heater/Boiler | Fuel Gas<100 | $PM_{10}$ | 7.45E-03 | lb/MMBtu | AP-42 Table 1.4-2; Footnote a: 1020 Btu/scf conversion |
| Heater/Boiler | Fuel Gas<100 | $PM_{2.5}$ | 7.45E-03 | lb/MMBtu | AP-42 Table 1.4-2; Footnote a: 1020 Btu/scf conversion |
| Heater/Boiler | Fuel Gas<100 | AVG $SO_2$ EFG | 1.90E-02 | lb/MMBtu | Based on average S concentration of 112 ppmv in 2009 and 118 in 2010; Footnote a: 1020 Btu/scf conversion |
| Heater/Boiler | Fuel Gas<100 | AVG $SO_2$ WFG | 5.58E-03 | lb/MMBtu | Based on average S concentration of 43 ppmv in 2009 and 24.8 in 2010; Footnote a: 1020 Btu/scf conversion |
| | | | | | |
| Heater/Boiler | Distillate>100 | VOC | 5.14E-03 | lb/MMBtu | AP-42 Table 1.3-3; Assumed average 148 MMBtu/Mgal |
| Heater/Boiler | Distillate>100 | CO | 3.38E-02 | lb/MMBtu | AP-42 Table 1.3-1; Assumed average 148 MMBtu/Mgal |
| Heater/Boiler | Distillate>100 | $NO_X$ | 3.18E-01 | lb/MMBtu | AP-42 Table 1.3-1; Assumed average 148 MMBtu/Mgal |
| Heater/Boiler | Distillate>100 | PM | 4.46E-02 | lb/MMBtu | AP-42 Table 1.3-1; Based on average fuel oil S concentration of 0.385% in 2009 and 0.35% in 2010;Assumed average 148 MMBtu/Mgal |
| Heater/Boiler | Distillate>100 | $PM_{10}$ | 5.47E-02 | lb/MMBtu | AP-42 Table 1.3-1; Based on average fuel oil S concentration of 0.385% in 2009 and 0.35% in 2010;Assumed average 148 MMBtu/Mgal |
| Heater/Boiler | Distillate>100 | $PM_{2.5}$ | 5.47E-02 | lb/MMBtu | AP-42 Table 1.3-1; Based on average fuel oil S concentration of 0.385% in 2009 and 0.35% in 2010;Assumed average 148 MMBtu/Mgal |
| Heater/Boiler | Distillate>100 | $SO_2$ | 3.90E-01 | lb/MMBtu | AP-42 Table 1.3-1; Based on average fuel oil S concentration of 0.385% in 2009 and 0.35% in 2010;Assumed average 148 MMBtu/Mgal |
| | | | | | |
| Heater/Boiler | Distillate<100 | VOC | 5.14E-03 | lb/MMBtu | AP-42 Table 1.3-3; Assumed average 148 MMBtu/Mgal |
| Heater/Boiler | Distillate<100 | CO | 3.38E-02 | lb/MMBtu | AP-42 Table 1.3-1; Assumed average 148 MMBtu/Mgal |
| Heater/Boiler | Distillate<100 | $NO_X$ | 3.18E-01 | lb/MMBtu | AP-42 Table 1.3-1; Assumed average 148 MMBtu/Mgal |
| Heater/Boiler | Distillate<100 | PM | 4.46E-02 | lb/MMBtu | AP-42 Table 1.3-1; Based on average fuel oil S concentration of 0.385% in 2009 and 0.35% in 2010;Assumed average 148 MMBtu/Mgal |
| Heater/Boiler | Distillate<100 | $PM_{10}$ | 5.47E-02 | lb/MMBtu | AP-42 Table 1.3-1; Based on average fuel oil S concentration of 0.385% in 2009 and 0.35% in 2010;Assumed average 148 MMBtu/Mgal |
| Heater/Boiler | Distillate<100 | $PM_{2.5}$ | 5.47E-02 | lb/MMBtu | AP-42 Table 1.3-1; Based on average fuel oil S concentration of 0.385% in 2009 and 0.35% in 2010;Assumed average 148 MMBtu/Mgal |
| Heater/Boiler | Distillate<100 | $SO_2$ | 3.90E-01 | lb/MMBtu | AP-42 Table 1.3-1; Based on average fuel oil S concentration of 0.385% in 2009 and 0.35% in 2010;Assumed average 148 MMBtu/Mgal |
| | | | | | |
| Compressor | LPG (Other) | VOC | 2.96E-02 | lb/MMBtu | AP-42 Table 3.2-3 |
| Compressor | LPG (Other) | CO | 3.72E+00 | lb/MMBtu | AP-42 Table 3.2-3 |
| Compressor | LPG (Other) | $NO_X$ | 2.27E+00 | lb/MMBtu | AP-42 Table 3.2-3 |
| Compressor | LPG (Other) | PM | 9.50E-03 | lb/MMBtu | AP-42 Table 3.2-3 |
| Compressor | LPG (Other) | $PM_{10}$ | 1.94E-02 | lb/MMBtu | AP-42 Table 3.2-3 |
| Compressor | LPG (Other) | $PM_{2.5}$ | 1.94E-02 | lb/MMBtu | AP-42 Table 3.2-3 |
| Compressor | LPG (Other) | $SO_2$ | 5.88E-04 | lb/MMBtu | AP-42 Table 3.2-3 |
| Compressor | | | | | |
| Compressor | LPG (6DD) | VOC | 1.18E-01 | lb/MMBtu | AP-42 Table 3.2-2 |
| Compressor | LPG (6DD) | CO | 5.57E-01 | lb/MMBtu | AP-42 Table 3.2-2 |

| Table C-15. Combustion Unit Emission Factors | | | | | |
|---|---|---|---|---|---|
| **Unit Type** | **Fuel Fired** | **Pollutant** | **Value** | **Units** | **Comment** |
| Compressor | LPG (6DD) | $NO_X$ | 4.08E+00 | lb/MMBtu | AP-42 Table 3.2-2 |
| Compressor | LPG (6DD) | PM | 7.71E-05 | lb/MMBtu | AP-42 Table 3.2-2 |
| Compressor | LPG (6DD) | $PM_{10}$ | 9.99E-03 | lb/MMBtu | AP-42 Table 3.2-2 |
| Compressor | LPG (6DD) | $PM_{2.5}$ | 9.99E-03 | lb/MMBtu | AP-42 Table 3.2-2 |
| Compressor | LPG (6DD) | $SO_2$ | 5.88E-04 | lb/MMBtu | AP-42 Table 3.2-2 |
| | | | | | |
| Gas Turbine | Fuel Gas/LPG | VOC | 2.10E-03 | lb/MMBtu | AP-42 Table 3.1-2a |
| Gas Turbine | Fuel Gas/LPG | CO | 8.20E-02 | lb/MMBtu | AP-42 Table 3.1-1 |
| Gas Turbine | Fuel Gas/LPG | $NO_X$ | 3.20E-01 | lb/MMBtu | AP-42 Table 3.1-1 |
| Gas Turbine | Fuel Gas/LPG | PM | 1.90E-03 | lb/MMBtu | AP-42 Table 3.1-2a |
| Gas Turbine | Fuel Gas/LPG | $PM_{10}$ | 6.60E-03 | lb/MMBtu | AP-42 Table 3.1-2a |
| Gas Turbine | Fuel Gas/LPG | $PM_{2.5}$ | 6.60E-03 | lb/MMBtu | AP-42 Table 3.1-2a |
| Gas Turbine | Fuel Gas/LPG | AVG $SO_2$ EFG | 1.15E-02 | lb/MMBtu | AP-42 Table 3.1-2a; Based on average S content of 0.0119% in 2009 and 0.013% in 2010 |
| Gas Turbine | Fuel Gas/LPG | AVG $SO_2$ WFG | 3.39E-03 | lb/MMBtu | AP-42 Table 3.1-2a; Based on average S content of 0.0046% in 2009 and 0.0026% in 2010 |
| | | | | | |
| Gas Turbine | Distillate | VOC | 4.10E-04 | lb/MMBtu | AP-42 Table 3.1-2a |
| Gas Turbine | Distillate | CO | 3.30E-03 | lb/MMBtu | AP-42 Table 3.1-1 |
| Gas Turbine | Distillate | $NO_X$ | 8.80E-01 | lb/MMBtu | AP-42 Table 3.1-1 |
| Gas Turbine | Distillate | PM | 4.30E-03 | lb/MMBtu | AP-42 Table 3.1-2a |
| Gas Turbine | Distillate | $PM_{10}$ | 1.20E-02 | lb/MMBtu | AP-42 Table 3.1-2a |
| Gas Turbine | Distillate | $PM_{2.5}$ | 1.20E-02 | lb/MMBtu | AP-42 Table 3.1-2a |
| Gas Turbine | Distillate | $SO_2$ | 2.35E-02 | lb/MMBtu | AP-42 Table 3.1-2a; Based on average oil S concentration of 0.028% in 2009 and 0.018% in 2010 |
| | | | | | |
| Diesel Pump | Distillate | VOC | 3.50E-01 | lb/MMBtu | AP-42 Table 3.3-1 |
| Diesel Pump | Distillate | CO | 9.50E-01 | lb/MMBtu | AP-42 Table 3.3-1 |
| Diesel Pump | Distillate | $NO_X$ | 4.41E+00 | lb/MMBtu | AP-42 Table 3.3-1 |
| Diesel Pump | Distillate | PM | 3.10E-01 | lb/MMBtu | AP-42 Table 3.3-1; All particulate is assumed to be ≤1µm in size. |
| Diesel Pump | Distillate | $PM_{10}$ | 3.10E-01 | lb/MMBtu | AP-42 Table 3.3-1; All particulate is assumed to be ≤1µm in size. |
| Diesel Pump | Distillate | $PM_{2.5}$ | 3.10E-01 | lb/MMBtu | AP-42 Table 3.3-1; All particulate is assumed to be ≤1µm in size. |
| Diesel Pump | Distillate | $SO_2$ | 2.90E-01 | lb/MMBtu | AP-42 Table 3.3-1 |

| Table C-16. Unit Specific Emission Factors | | | | | |
|---|---|---|---|---|---|
| Unit Specific NOx Emission Factors | | | | | |
| Emissions Unit | Process Unit | 2009 NOx Factor | 2010 NOx Factor | Units | Comment |
| H-200 | PENEX | 0.191 | 0.191 | lb/MMBtu | Stack Test |
| H-201 | PENEX | 0.150 | 0.150 | lb/MMBtu | Stack Test |
| C-200A | PENEX | 0.310 | 0.000 | lb/MMBtu | 2009 Gaseous Emissions Test Report 5DD and Penex Compressors- Quarterly Reports |
| C-200B | PENEX | 0.070 | 0.160 | lb/MMBtu | 2009 Gaseous Emissions Test Report 5DD and Penex Compressors- Quarterly Reports |
| C-200C | PENEX | 0.130 | 0.035 | lb/MMBtu | 2009 Gaseous Emissions Test Report 5DD and Penex Compressors- Quarterly Reports |
| H-801 | 2 DD | 0.094 | 0.094 | lb/MMBtu | Stack Test |
| H-2202 | 4 DD | 0.132 | 0.132 | lb/MMBtu | Stack Test |
| C-2400A | 5 DD | 0.270 | 0.487 | lb/MMBtu | 2009 Gaseous Emissions Test Report 5DD and Penex Compressors- Quarterly Reports |
| C-2400B | 5 DD | 0.040 | 0.090 | lb/MMBtu | 2009 Gaseous Emissions Test Report 5DD and Penex Compressors- Quarterly Reports |
| H-2501 | NAPH FRAC | 0.085 | 0.085 | lb/MMBtu | Stack Test |
| H-4302 | 7 DD | 0.102 | 0.102 | lb/MMBtu | Stack Test |
| H-4401 | 3 PLATFORMER | 0.130 | 0.130 | lb/MMBtu | Stack Test |
| H-4451 | 3 PLATFORMER | 0.152 | 0.152 | lb/MMBtu | Stack Test |
| H-4452 | 3 PLATFORMER | 0.152 | 0.152 | lb/MMBtu | Stack Test |
| H-4453 | 3 PLATFORMER | 0.152 | 0.152 | lb/MMBtu | Stack Test |
| H-4454 | 3 PLATFORMER | 0.152 | 0.152 | lb/MMBtu | Stack Test |
| H-4455 | 3 PLATFORMER | 0.090 | 0.090 | lb/MMBtu | Stack Test |
| H-4602 | 6 DD | 0.107 | 0.107 | lb/MMBtu | Stack Test |
| C-4601A | 6 DD | 3.589 | 3.589 | lb/MMBtu | Stack Test |
| C-4601B | 6 DD | 3.462 | 3.462 | lb/MMBtu | Stack Test |
| C-4601C | 6 DD | 3.235 | 3.235 | lb/MMBtu | Stack Test |
| H-5302 | 9 DD | 0.118 | 0.118 | lb/MMBtu | Stack Test |
| H-5401 | 4 PLATFORMER | 0.123 | 0.123 | lb/MMBtu | Stack Test |
| H-5451 | 4 PLATFORMER | 0.142 | 0.142 | lb/MMBtu | Stack Test |
| H-5452 | 4 PLATFORMER | 0.142 | 0.142 | lb/MMBtu | Stack Test |
| H-5453 | 4 PLATFORMER | 0.142 | 0.142 | lb/MMBtu | Stack Test |
| H-5454 | 4 PLATFORMER | 0.142 | 0.142 | lb/MMBtu | Stack Test |
| H-5455 | 4 PLATFORMER | 0.119 | 0.119 | lb/MMBtu | Stack Test |
| #8 Boiler (B-3303) | | 0.227 | 0.227 | lb/MMBtu | Stack Test |
| #9 Boiler (B-3304) | | 0.257 | 0.257 | lb/MMBtu | Stack Test |
| GT No. 4 (G-3404) | | 0.518 | 0.518 | lb/MMBtu | Stack Test |
| GT No. 5 (G-3405) | | 0.522 | 0.522 | lb/MMBtu | Stack Test |
| GT No. 7 (G-3407) | | 0.666 | 0.666 | lb/MMBtu | Stack Test |
| GT No. 8 (G-3408) | | 0.625 | 0.625 | lb/MMBtu | Stack Test |
| STK-7801 | | 0.092 | 0.092 | lb/MMBtu | Stack Test |
| H-8501A | Coker | 0.0258 | 0.0258 | lb/MMBtu | August 2007 Test Report for Emissions Characterizations at Hovensa, LLC |
| H-8501B | Coker | 0.0288 | 0.0288 | lb/MMBtu | August 2007 Test Report for Emissions Characterizations at Hovensa, LLC |
| | | | | | |
| Unit Specific CO Emission Factors | | | | | |
| Emissions Unit | Process Unit | 2009 CO Factor | 2010 CO Factor | Units | Comment |
| C-200A | PENEX | 1.400 | 1.940 | lb/MMBtu | 2009 Gaseous Emissions Test Report 5DD and Penex Compressors- Quarterly Reports |
| C-200B | PENEX | 1.650 | 1.740 | lb/MMBtu | 2009 Gaseous Emissions Test Report 5DD and Penex Compressors- Quarterly Reports |
| C-200C | PENEX | 0.610 | 1.448 | lb/MMBtu | 2009 Gaseous Emissions Test Report 5DD and Penex Compressors- Quarterly Reports |
| C-2400A | 5 DD | 1.200 | 1.580 | lb/MMBtu | 2009 Gaseous Emissions Test Report 5DD and Penex Compressors- Quarterly Reports |
| C-2400B | 5 DD | 1.210 | 0.680 | lb/MMBtu | 2009 Gaseous Emissions Test Report 5DD and Penex Compressors- Quarterly Reports |
| H-8501A | Coker | 0.003 | 0.003 | lb/MMBtu | August 2007 Test Report for Emissions Characterizations at Hovensa, LLC |

**Table C-16. Unit Specific Emission Factors**

| | | | | | |
|---|---|---|---|---|---|
| Unit Specific NOx Emission Factors | | | | | |
| H-8501B | Coker | 0.003 | 0.003 | lb/MMBtu | August 2007 Test Report for Emissions Characterizations at Hovensa, LLC |
| | | | | | |
| Unit Specific PM Emission Factors | | | | | |
| Emissions Unit | Process Unit | 2009 PM Factor | 2010 PM Factor | Units | |
| H-8501A | Coker | 7.50E-04 | 7.50E-04 | lb/MMBtu | August 2007 Test Report for Emissions Characterizations at Hovensa, LLC |
| H-8501B | Coker | 8.33E-04 | 8.33E-04 | lb/MMBtu | August 2007 Test Report for Emissions Characterizations at Hovensa, LLC |
| FCCU | FCCU | 3.40E-02 | 3.40E-02 | lb/Mlb coke burn | February 2007 Stack Test |
| | | | | | |
| Unit Specific PM10/PM2.5 Emission Factors | | | | | |
| Emissions Unit | Process Unit | 2009 PM10/PM2.5 Factor | 2010 PM10/PM2.5 Factor | Units | |
| H-8501A | Coker | 0.0047 | 0.0047 | lb/MMBtu | August 2007 Test Report for Emissions Characterizations at Hovensa, LLC |
| H-8501B | Coker | 0.00225 | 0.00225 | lb/MMBtu | August 2007 Test Report for Emissions Characterizations at Hovensa, LLC |
| FCCU (PM10) | FCCU | 0.312 | 0.312 | lb/Mlb coke burn | February 2007 Stack Test |
| FCCU (PM2.5) | FCCU | 0.3062 | 0.3062 | lb/Mlb coke burn | February 2007 Stack Test |